

WORKBENCH

35c / SEPTEMBER-OCTOBER / 1964

ICD

47

Enlarge A Family Room

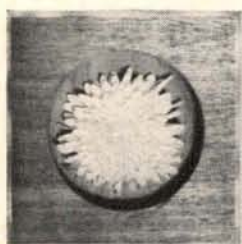


Using Wood Chisels

Child's Chair And Settle

Ranch-House Bird Feeder

American Windsor Chair



Make Your Own Nature Tiles With Colorful Leaves, Flowers, Butterflies Permanently Preserved in Castoglas *Pours Like Honey — Sets Like Glass!*

The Pansy shown in this photograph was embedded in crystal-clear Castolite in 1946. It is as lovely now as the day we picked it in our garden. NOW—a greatly simplified method enables you to do the same with Castoglas on wood, hardboard, metal or between layers of glass mat.



How You Can Make These Tiles. The three photos below illustrate the simple casting method. Mix a small amount of Castoglas with Hardener and pour a thin layer on the wood. Then place a leaf, or any other interesting object, on this wet surface which will harden in 30 minutes at room temperature. A covering coat of Castoglas completes the process. That's all there is to it. A hundred years from now, this leaf will be as new as... well, maybe you don't care. But you get the idea.

What You Can Do With Tiles. Use them under serving dishes, as coasters, trays, wall decorations, lamp bases, bookends. Or make a table or countertop; Castoglas is waterproof, heat- and acid-resistant and easily cleaned. Design seed mosaics or embed photographs, colorful reproductions of birds or pets, coins and stamps and other mementos of your travels—even your children's crayon drawings. There's no end to the truly distinctive accessories you can create with Castoglas.

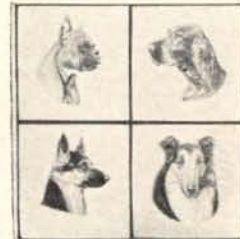
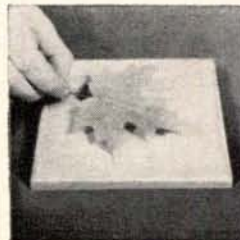
Just A Few Notes About The Various Embedments. The brilliantly colored fall leaves, the ferns, coral bells and the chrysanthemum were gathered in our own garden. From the island of Formosa came the butterflies. The colorful prints of birds and dogs were cut from National Wildlife stationery. Embedded in Castoglas on 4 x 4 inch masonite, they look like expensive, handpainted porcelain you see in high-priced specialty shops.

The coins were some loose change left over from a recent journey abroad. (In fact, that's all we had left!) Rice, mustard seed, barley and split peas were borrowed from the pantry to make the seed mosaics. If we weren't so modest about the whole thing, we'd come right out and tell you how impressed we are with our own handiwork. And the beauty of it is that you, too, can do all this and more, even if you have never worked with Castoglas before.

Easy To Make At Little Cost—about 20¢ for a 6 x 6 inch wood tile. As you can readily see, this is an exciting way to make wonderful gifts and to raise funds for your church or club and for yourself, too. For your copy of "How to Make and Use Nature Tiles", with complete illustrated step-by-step directions, mail 25¢ to Department 9-L.



THE CASTOLITE COMPANY Woodstock, Illinois
*The three photos directly below illustrate the basic embedding process.
It's as easy as it looks.*



PHIL RIZZUTO . . . Radio Network Sportscaster and Former Yankee Shortstop DISCOVERS A RICHLY REWARDING NEW NATIONAL PASTIME!

"There's a new indoor pastime I'd been introduced to recently that has me wondering where it's been all my life. Until I outfitted the basement of my new home with a set of American Machine power tools, I had no idea how much fun it could be to make things out of wood—nor how easy it can really be. I am constantly amazed with the accuracy, speed and ease with which I can now make useful and beautiful things for the house, for the kids—and for my own pleasure and convenience. I don't know how they do it, but the remarkable low cost of these professional quality tools has taken nothing away from their ability to do a job."



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8" TILT ARBOR POWER SAW \$14.95

f.o.b. factory. Wt. 25 lbs.

Includes completely assembled cast iron and steel 8" tilt arbor power saw with ground cast iron table . . . less blade. If desired, RIP FENCE for easier work alignment, \$3.50 additional



REVOLUTIONARY PATENTS DECREASE COSTS, INCREASE EFFICIENCY
Full scale power tools of heavy duty 100% cast iron and steel. Streamlined design reduces weight, cuts material and production costs. Special patents provide added efficiency, accuracy, savings. Parts made, assembled, tested and packed right in our own factories, shipped direct . . . save store profits.

DOES WORK OF \$75 BENCH SAW
as is. Converts easily to equal any \$300 floor model cabinet units! Crosscuts, rips, mitres, cuts compound angles, dados, makes coves and mouldings.

FREE CABINET BASE PLANS
Use as portable bench saw as received (inset photo) . . . or transform easily and inexpensively into floor model (as shown) guar. to do work of floor models costing \$300. FREE plans . . . sheet of 3/4" plywood and 3-4 hours are all you'll need. Use your AMCO saw for cutting. Plans provide 27" x 24" work surface, 33" height, pullout sawdust bin, tool storage compartment.

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BLADE TILTS . . . TABLE STAYS LEVEL

- Locks securely at any angle to 50°, raises, lowers 0"-2 1/4"
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- Accessories available at factory prices
- RIP FENCE, if desired for easier work alignment: Std. size (for bench saw) \$3.50; larger fence (for cabinet base, as ill'd.) \$4.50.

6" SWING 3-FT. LATHE \$9.85

f.o.b. factory

Optional Faceplate for turning bowls, trays, lamp bases, rosettes, etc. \$2.50



Complete as shown

DOES THE WORK OF \$40 UNITS—
Sturdy all cast iron power tool turns wood or plastics with the precision and speed of machines selling for 4 times as much. Tubular steel bed, ball thrust cup center, spur center. T-Rest assembly, lever action tail stock.

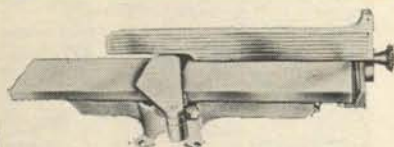
2 speed pulley. Fits any motor.

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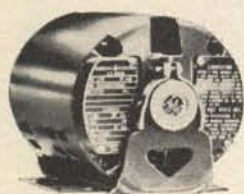
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(when purchased with any unit in this ad)

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f.o.b. factory if purchased separately, \$18.95



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1/2 hp ☐ \$18.95 (if purchased separately) with faceplate

Motor: ☐ \$12.95 (if purchased with other item) \$12.35 ☐

NAME

ADDRESS

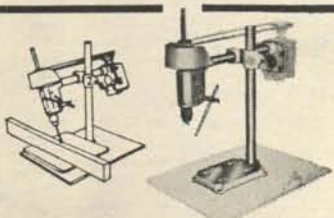
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WORKBENCH volume 20 number 5

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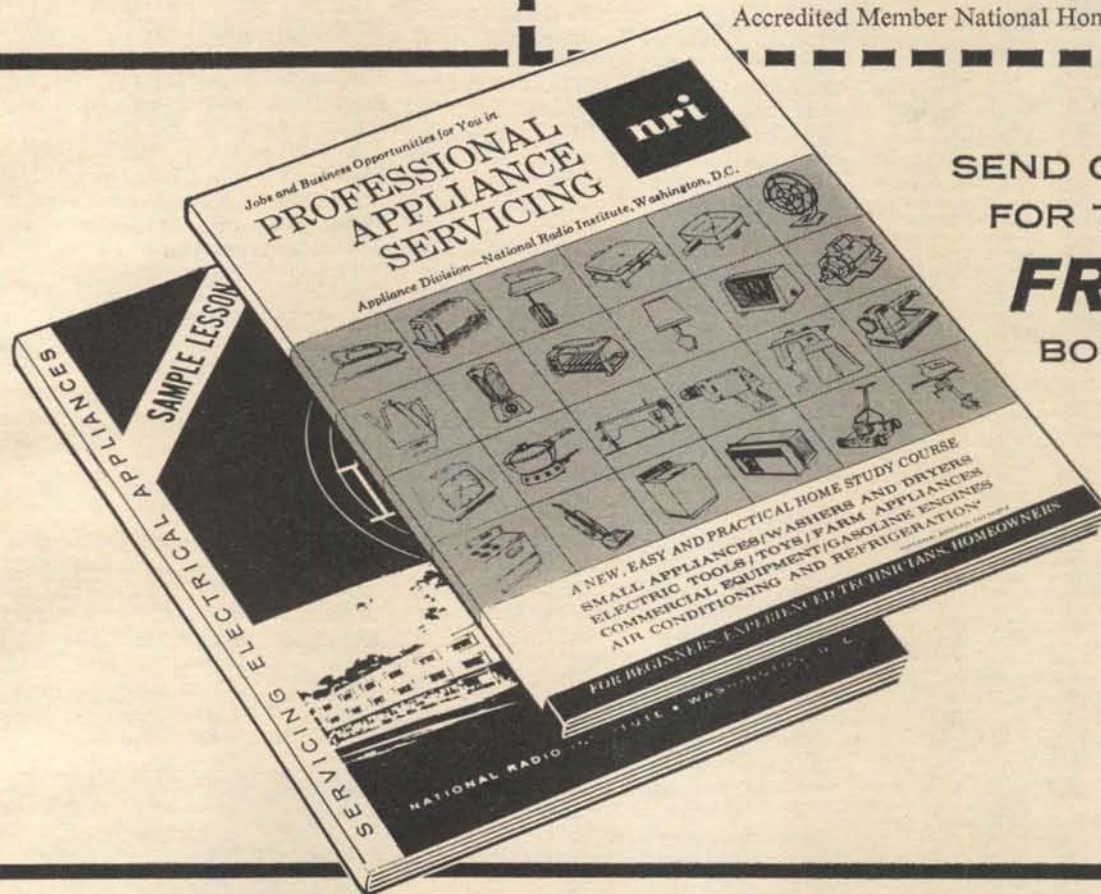
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IT CUTS

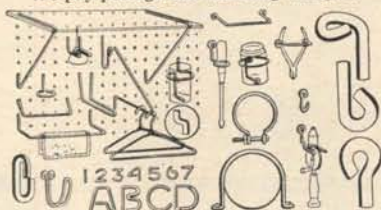
Cleanly and neatly, any wire except spring steel or piano wire. Wireformer will also straighten wire. With these combined features in one tool, you can make your own peg board hooks, all types of hangers, clamps, handles, braces, chains, racks, shelf and equipment brackets, mobiles, letters, numerals, or any shape you want.

A simple, precision made, vise held tool of innumerable uses. Forms an eye of $\frac{3}{16}$ " inside diameter (just right for any nail, screw, or bolt up to that size). No pliers needed. WIREFORMER does the work with the pressure of one finger. Straightens the wire if you make a mistake.

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Very complete instructions for precision forming (fully illustrated), special adapter for small size wire, and brochure showing many things you can make included. WIREFORMER is the most useful tool you can buy for your home, shop, cottage, farm, factory, garage, studio, or wotavu. As a gift, it's sure to please. Four dollar bills will get you one, otherwise send check or money order **\$3.98** for just

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Please ship the following prepaid:

— WIREFORMERS @ \$3.98 each (or 4 one dollar bills)
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☐ Ship prepaid. Enclosed please find check ☐
Money order ☐ Cash ☐ for \$
Ship C. O. D. plus postage and C. O. D. charges ☐.

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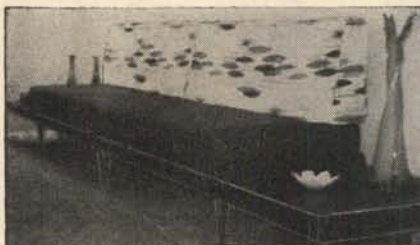
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Sold only by mail—not available in stores

Letters to the Editor

Dear Mr. Hedden:

Am sending a photo of a couch and end table I made. It is an item for the budget-minded, as the base of the unit is a hollow-core door. I attached a frame of 2 x 2s underneath extending it 2 ft. on each end to form the end tables. Walnut scraps were used for the table tops and moldings. Eight 9-in. legs were purchased items. Upholstery is 4-in. foam rubber; we had covers made, and they are fitted with zippers for easy removal for cleaning. I have two growing boys who love to bounce on furniture and the couch has taken the abuse very well. Jerry Mirman, Akron, Ohio.



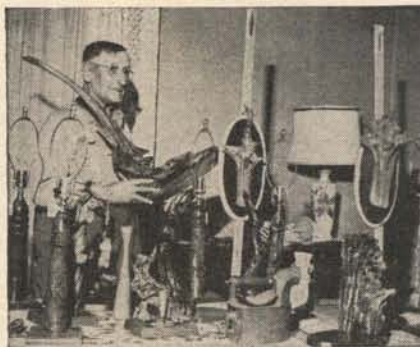
Dear Mr. Mirman:

We have seen couches made from doors before, but never with an extended frame on which tables were built. A clever idea; we send our congratulations.

Dear Mr. Hedden:

Enclosed find check for renewing my subscription; also a snapshot of some of my projects. Started the hobby at 80, now 83 and still at it. Most of my work is turning out lamps, also working with driftwood. Like the article on finishing driftwood.

C. S. Friar, Gibsonburg, Ohio.



Dear Mr. Friar:

You have really been busy, and the quality of your work shows that age is no barrier to being a skilled craftsman. We wish you many more years of enjoyment in your workshop.

Dear Mr. Hedden:

Would like a source for the thin plastic sheeting required for the Contemporary Lamps, as described in the May-June issue. Cannot find it in Salina.

W. E., Salina, Kans.

Dear Mr. W. E.:

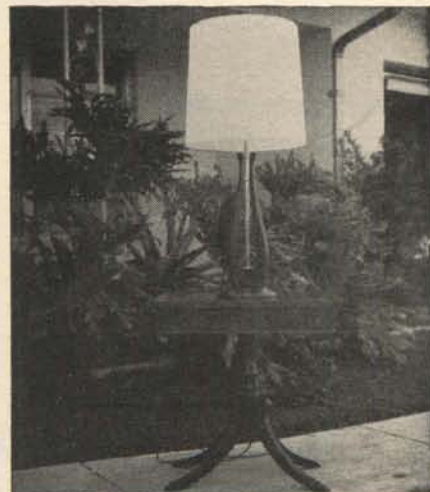
Plastic sheeting, both plain and with patterns or items embedded, usually can be purchased at hobby shops or department stores. We have three sources: Kerber Co., 132 Spring St., New York 12; Polyplastex United, 870 Springfield Rd., Union, N. J.; Miya Co., 373 Park Ave. South, New York City. Write to these companies and ask for the dealer nearest you.

Dear Mr. Hedden:

Enclosed is a snapshot of one of a pair of lamps I made from one of your plan sheets. I added an inverted brass cup to position the tops in relation to the brass center tube. The lamp is on a mahogany table I built some years ago.

At present am building a grandfather clock, gears and all. The works have been running seven months. The "seconds" pendulum is electrically driven and drives the wheelwork. The whole thing runs on a couple of flashlight batteries. Will build the walnut cabinet this summer.

Carl Blume, Dunedin, Fla.



Dear Mr. Blume:

The lamp is truly beautiful. We have investigated building clock works of wood and metal, but have decided that besides a lot of patient and skillful craftsmanship you would need considerable luck to have a successful project. We have therefore put the idea aside.

Dear Mr. Hedden:

Have problems finding projects I can handle, as I have lost the use of my right hand where I had my skill. Am learning to use my left hand, as I'm only 74 years young. Use a jig saw to make items for schools and children's hospitals during the winter.

Do you know where I can get project plans, tools and training for a one-hander?

H. K. Patterson, Timewell, Ill.

Dear Mr. Patterson:

We have no information in this field, but are sure there are projects, tools and training designed for persons with your handicap. If any reader has such information, address your letters in care of the editor, and they will be forwarded to Mr. Patterson.

Dear Mr. Hedden:

Been a subscriber to WORKBENCH for several years and read every issue with great pleasure. Am fascinated by boats, enclosing a photo of myself and a model of a 30-ft. cruiser, (no power), I built. Has cabin, running and mast lights powered from house current. Took about 700 hours to finish the boat. Would like to sell it; but even at 25 cents an hour, would have to ask \$150. Would sell for less, as I would like to build another.

A. M. Augunas, 1225 S. Palmway, Lake Worth, Fla.



Dear Mr. Augunas:

It's unfortunate, but with a labor of love, such as your boat, you never make a profit and are lucky to just break even. Have you checked the souvenir shops in nearby cities where there are people that might have more money to spend?

Jay W. Hedden

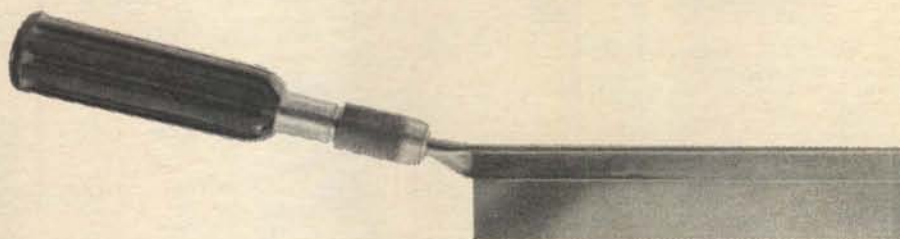
Take a cross-cut saw.

**Remove the handle
and trim the blade down
to 5 1/2" x 1".**

**Hone it razor-thin
and razor-fine.**

**Now, secure the blade
to an angled, sure-grip handle.**

And what have you got?



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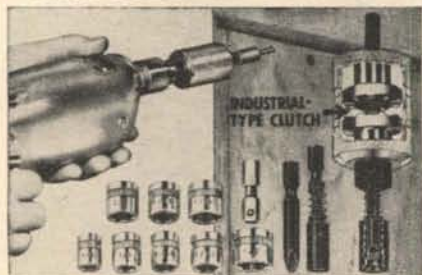
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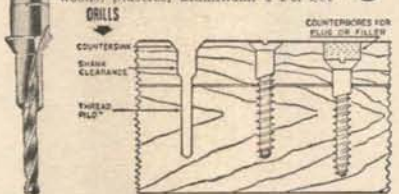
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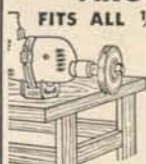
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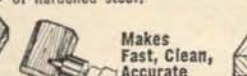


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NOW FOR THE FIRST TIME you can do corner beveling and corner rounding with ANY ELECTRIC DRILL, drill press. Simply slip ARCO Adjustable Bevel-Cutter or Radius-Cutter in drill chuck and it's ready to work! Special Dual Guides assure accurate cuts along entire length and width of workpiece. Cuts wood, plastics, soft metals. Quality made in U.S.A. of hardened steel.



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SPECIAL! Save by buying set of above 4 tools. No. 15, Set of 4.....**ONLY \$5.75**

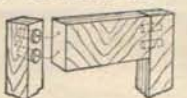


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WITH "DADO-ARBOR" that CUTS GROOVES! CUTS 2x4's, ALL ANGLES! Fits ANY 1/4" Drill Build anything from a bookcase to a bungalow with this powerful saw attachment. Rips and crosscuts up to 2" board in one easy cut. Exclusive "Dado-Arbor" swivels sawblade to cut grooves up to 1/2" wide x 1" deep in one cut! Not even a \$100 portable saw has a dado cutter! Has graduated gages for ripping, depth and angle cuts. Can be used with one hand. Strong steel gear drive and self-lubricating lifetime bearings assure long trouble-free use. Includes 5" Combination Blade, 1-Year Factory Guarantee. No. 3100—List Price \$13.95—SPECIAL.....**\$9.88**

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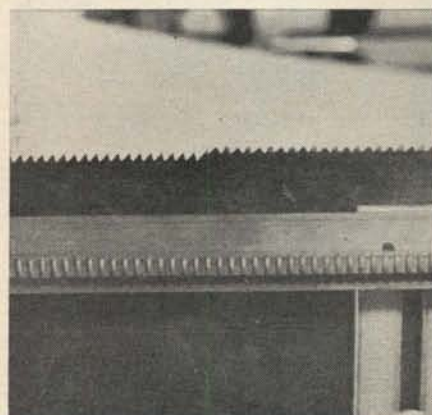
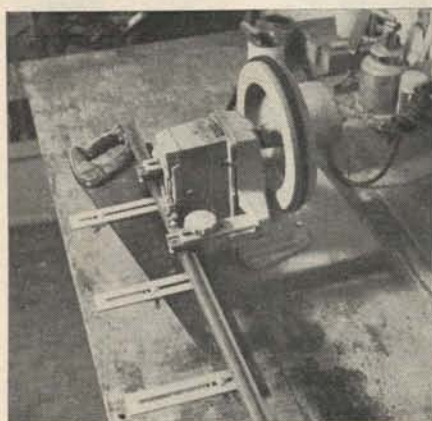
HAND-SAW RETOOTHING



When you have a favorite hand saw that you have used for years, and carefully hand-filed it frequently, what can be done to give it new life? If the tool sharpening service in your area has a retooter, such as the Foley unit we tested, this tool will give you what amounts to a new saw. Through the courtesy of the Foley Company we had a retooter shipped to our Model Shop for testing. The saw we retooted was about fifteen years old and had never been sharpened professionally.

Carefully following the instruction booklet, (not following instructions seems to be the biggest problem with any sort of tool, according to many reports we receive), we set up the saw, without removing the handle, on the carrier. The carrier is interchangeable with the carriers used with the Foley Filer, so a retooted saw can immediately be run through the Filer after cutting new teeth. We adjusted the

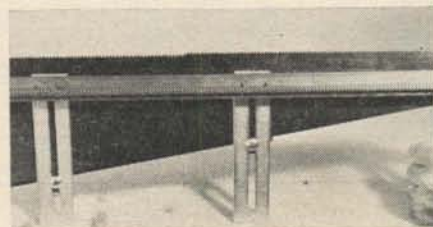
Little drawer in base of machine receives metal removed when new teeth are cut. Blade required three passes.



Closeup shows how teeth that have been hand-filed are undersize, misshapen; new-cut teeth are at left.

blade with the gauge provided, fitted the carrier in the machine and ran the blade through. The photos show the new teeth, and how the old ones are worn down and undersize. Low spots in the blade required that we make three passes to make all new teeth. With the new teeth set, and the blade run through the Foley Filer, the saw cut better than when it was new. We award our Shop-Tested Seal to both the Retooter and the Filer. $\Delta \Delta$

Saw blade is held in same carrier that is used to run it through automatic filer. Teeth first are set.



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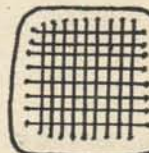
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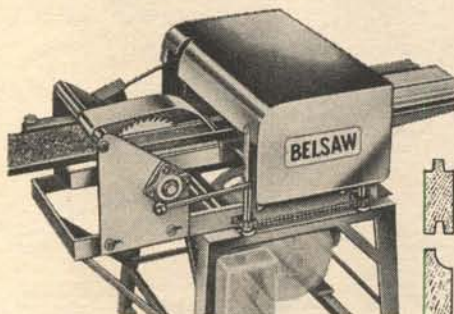
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CORNER SHELF

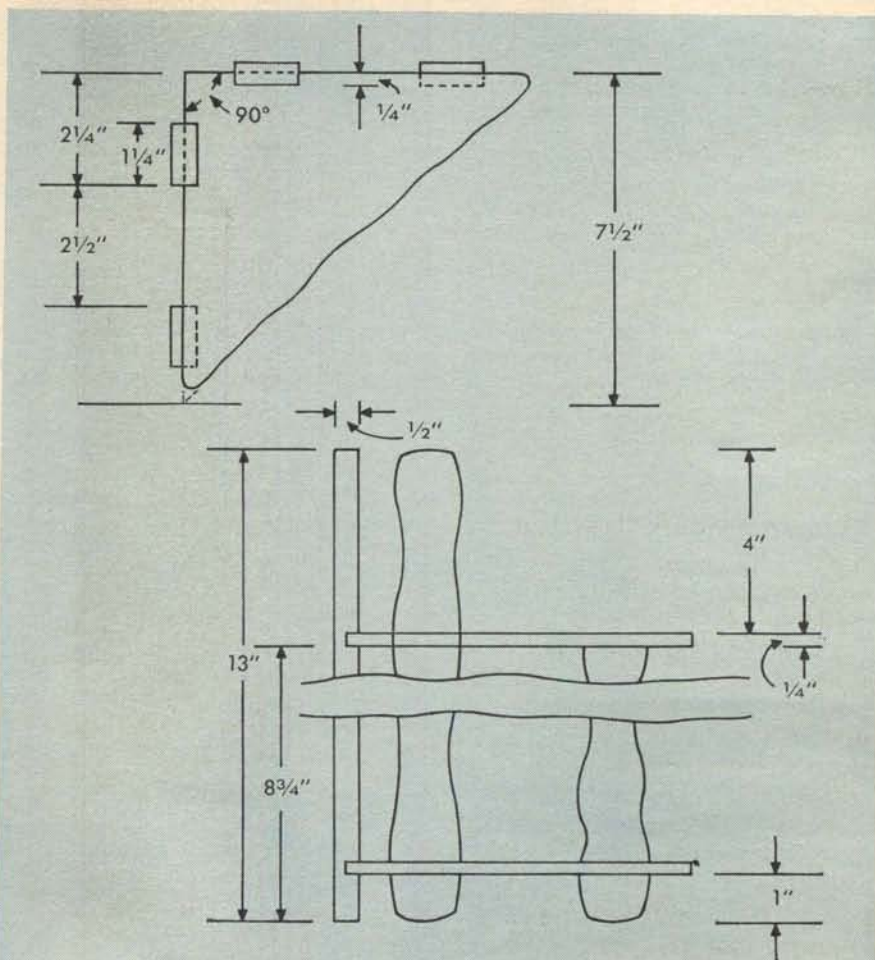
R. J. DeCRISTOFORO

(Hand-Tool Project)



This attractive corner shelf is designed so it can be hung on the wall, or simply placed on a table. In the latter case you will have to carefully trim the lower ends of the "legs" to assure the shelf is perfectly level.

Material for the shelf can be salvaged from fruit crates, or scraps of stock from the workshop can be utilized. Because of the "free-form" shape of the uprights, getting them true and square is not a problem. The back corners of the two shelves, however, will have to be quite close to 90 deg. to present a neat appearance. Stock for the uprights can be $\frac{1}{2}$ or $\frac{3}{4}$ -in. material. The shelves are $\frac{1}{4}$ -in. stock, and they are fitted in grooves cut with a saw to a depth of $\frac{1}{4}$ -in. Position all the uprights side by side when making the cuts, to assure they are parallel and the same depth. $\triangle \triangle$



Stop calling every portable saw a Skilsaw!

We've noticed that many men—carpenters especially—are in the habit of referring to every portable saw as a Skilsaw. And we can understand how it happens. Skil pioneered the development of the portable circular saw, and has kept at it for 40 years. Today there are more of ours in use than any other make.

Nonetheless, we hasten to point out that a Skilsaw power saw is *not* just any saw. As you might expect, in 40 years we've come up with some pretty strong improvements. Features that account for our saws having stayed ahead of the rest.

Saws Lead a Hard Life

Abuse is the way of life for a circular saw. Green and wet lumber, stone and other dense materials make frequent overloading inevitable, and invite motor burn-out. Skil's solution: a Super Burn-out Protected Motor, encased in a special heat resistant resin and well able to stand heavy going. What's more, should the blade bind or jam, a Vari-Torque safety clutch protects gears and other parts from damage.

Nuisances Eliminated

We've also done everything to make Skilsaws about as automatic as you could ask.

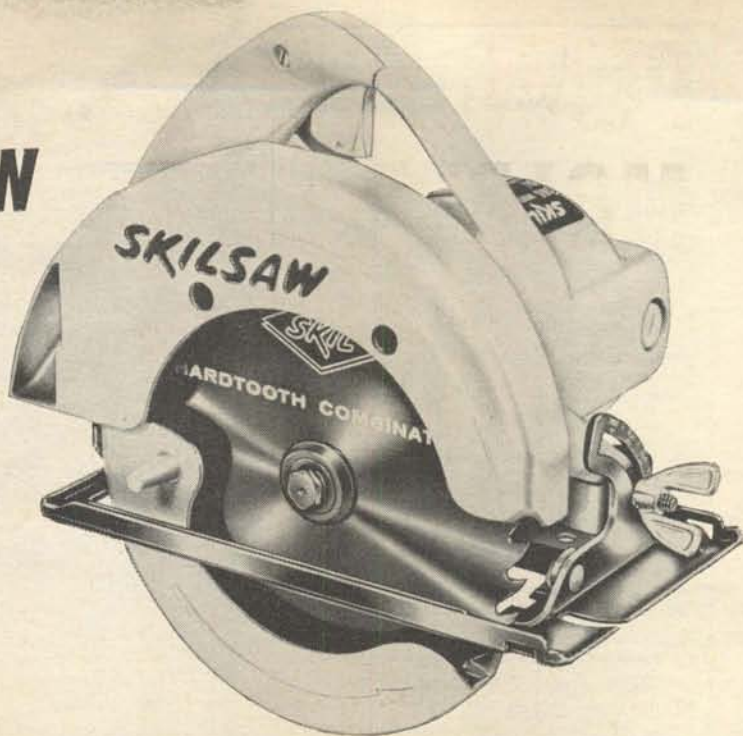
Exclusive sawdust ejection—With some circular saws, sawdust can be a real headache. It builds up in front of your line of cut and slows you down. Skil solves this with an air stream ejection system

that blows sawdust away from you and down to the floor. Still another reason why you see where you're going with a Skilsaw: The upper blade guard is specially designed to give you a clear, continuous view of the blade all through the cut.

Easy-to-set depth control—For safe, splinter-free cutting, a circular saw blade should extend about 1/2-inch below the depth of the piece to be cut. But most blade adjustments play hard-to-get-at . . . are located behind the blade or inside the blade guard. On a Skilsaw, by contrast, you can conveniently set blade depth in seconds, with one hand. (By the way, other saws tend to "wobble" when making shallow cuts. But your Skilsaw stays on the straight and narrow at any depth.)

Bind-free lower guard—Better demonstrated than explained is Skil's lower blade guard that retracts automatically to speed angle cutting. No binding here—even on compound miter cuts.

Exclusive blade lock—Blade changing on heavy-duty Skilsaw models is simplicity itself. Push a button—the blade is safely engaged and locked.



Don't Slight Service

When a Skilsaw Power Saw leaves our plant it carries a *lifetime* guarantee against defects in material or workmanship. And we back up this guarantee with one of the most extensive nationwide networks of factory service centers in the field. Unlike most cheap power saws, a Skilsaw Circular Saw can be serviced anywhere in matter of hours or a couple of days. (We know of instances—not too rare—where owners of other makes have waited a month or more while the tool is in repair.)

A Size to Suit You

Skilsaw Power Saws are made for a range of blade sizes from 5 1/2" to 8 1/4", with prices starting under \$30. Look for them at lumber, hardware and department stores where you expect to find quality.

Remember—*every circular saw is not a Skilsaw*. Just most of them.

SKIL
POWER TOOLS

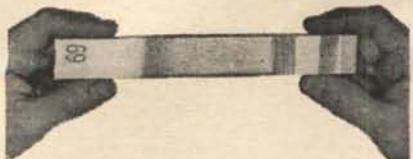
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"SCRATCH-BRUSHED" PLANTER



While this planter, in which an ordinary clay pot is fitted, is not especially unusual in design, the appearance is, and is created by "scratch-brushing" the stock. The two lower shelves are left smooth, only the back members and the top, or roof, are treated with a wire brush. Any type lumber can be used, even fir plywood, but the stock must have a fairly strong grain. When the stock is held against a wire brush the softer portions of the wood are cut away, and the harder, resinous portion is accented. This treatment produces

an "antique" appearance which is most pleasing.

Clay pots vary in size, so measure the one to be used before cutting the hole in the shelf. The pot used measured $3\frac{3}{8}$ in. under the rim, so it fitted easily into the 4-in. opening.

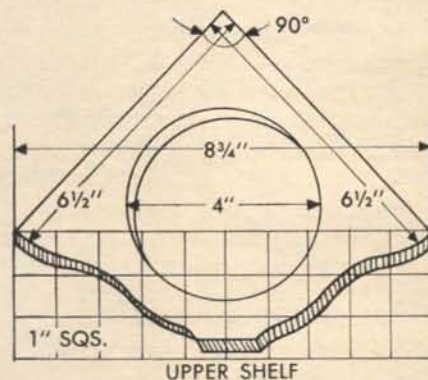
When cutting the two back members, note that one is cut the full width of the pattern made by enlarging the squared drawing, the other one is narrower by the thickness of the stock. The top, or "roof" is cut as dimensioned, the edges being cut at 20 deg. to posi-



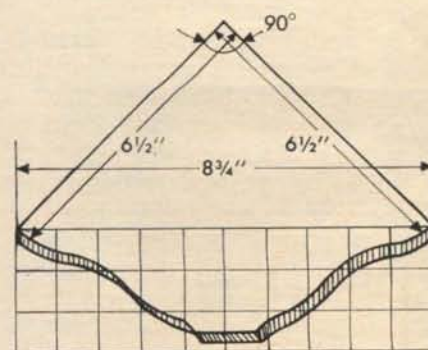
Two lower shelves are left in their natural state, the top, or "roof" is scratch-brushed for effect.



Regular wire brush is used to "scratch-brush" the fir plywood, removing the softer white portion of the wood.

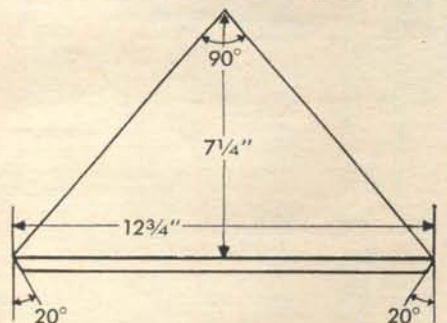
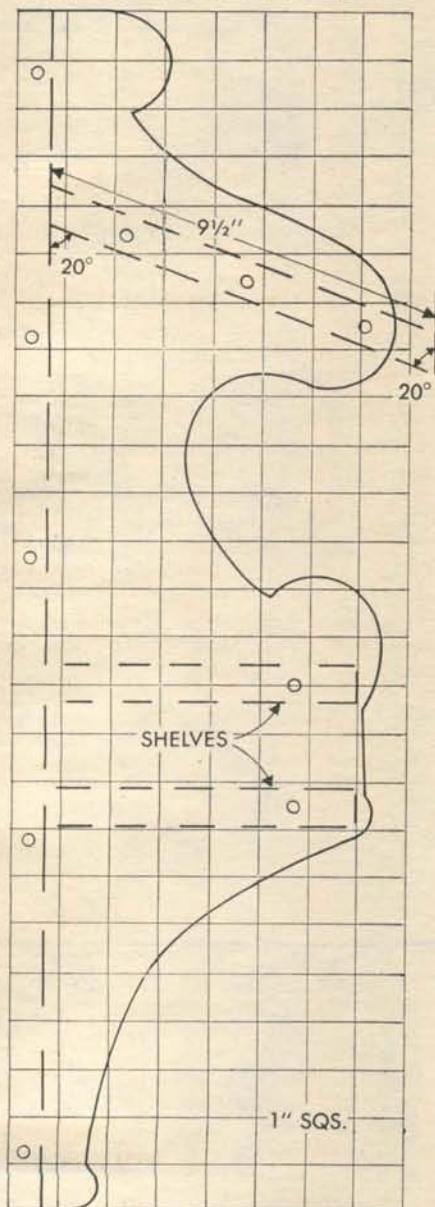


UPPER SHELF



BOTTOM SHELF

For finishing use chocolate-brown semi-gloss enamel thinned with turpentine. Paint the assembled planter all over, then wipe with a soft cloth until the wood is dry. When the paint is dried completely, apply two coats of varnish. △ △



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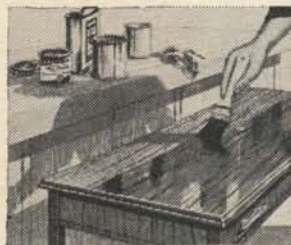
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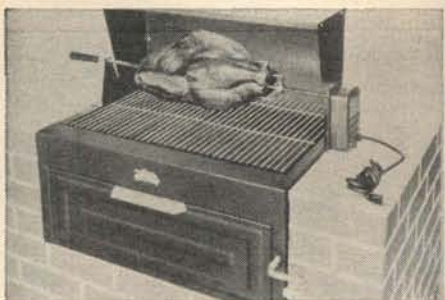
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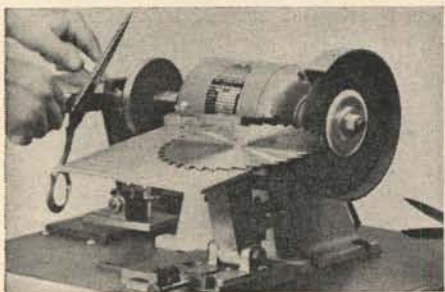
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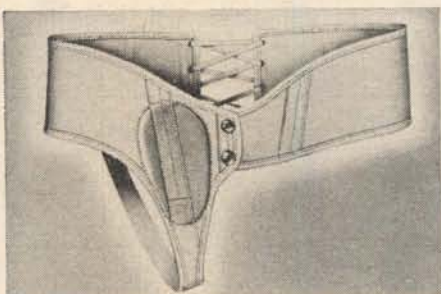
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Patented Rupture-Easer®

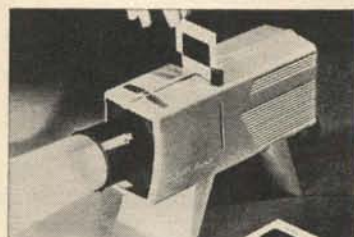
No fitting required. A strong, form-fitting washable support for reducible inguinal hernia. Back lacing adjustable. Snaps up front. Adjustable leg strap. Soft, flat groin pad. No steel or leather bands. For men, women, children. Send measurement around the lowest part of abdomen and state right, left side or double. Single models, \$4.95; double models, \$5.95 plus 25c postage. Piper Brace, Dept. WB-94, 811 Wyandotte, Kansas City, Mo. 64105.



Build This Baritone Ukulele

This baritone ukulele is tuned and played like the first four strings of the guitar. A rich, mellow tone, from an instrument only slightly larger than the standard ukulele. An exciting project for the do-it-yourselfer. Sounds more like a guitar than a ukulele. Full size plans include detailed instructions, construction tips, sources for special woods and materials. Plans are just \$2.00 from: Ukulele, Workbench, 543 Westport Road, Kansas City, Mo. 64111.

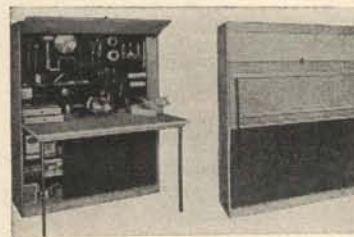
CORDLESS SLIDE PROJECTOR uses three size D flashlight dry cells and patented focus control to produce 12 x 18-in. pictures on almost any surface. Projects 35 mm slides or film strips. Ideal for travelers, salesmen making visual presentations, for young camera enthusiasts who want a projector rather than a viewer. \$7.95 ppd. (dry cells not included) from Vee-Gee Supply Co., Dept. W, Box 4264, Milwaukee, Wis., 53210.



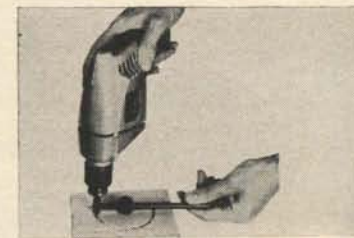
USE-TESTED BY THE STAFF, this device makes raised-letter labels on plastic tape. Contact adhesive on the tape sticks to almost anything. Ideal for labeling tools with your name so borrowers cannot forget, for marking containers as to contents, for personalizing dozens of items. Plastic tapes are available in a variety of colors. Dymo Home Labelmaker is sold everywhere at \$9.95, with additional magazines of tape at 75 cents and \$1.



FOLD-UP WORKBENCH comes in 3, 4 and 5-ft. widths, all are only 10 in. deep. Special work top is 24 in. deep, can be quickly and easily switched to be at right angles to cabinet on either right or left side. Tempered Peg Board back panel allows use of standard Peg Board fasteners; selection included. Each Kwiki-Shop shipped knocked down, ready to paint. Prices start at \$59.95. E. R. Lurey Co., 2914 W. Medill, Chicago 47.



CIRCLES FROM 1½ TO 12 in. in diameter can be cut with this tool that is chucked in any electric drill motor. Works effectively in a drill press also. Cuts wood and light metal; makes holes for speakers, vents, pipes, ceiling lights, etc. Compass Cutter comes complete with special cutting bit and easy-to-follow instructions. Ideal for any shop. Just \$3.98 ppd. from Nassau Shores H & G, Dept. 50, 5500 Merrick Rd., Massapequa, N. Y.



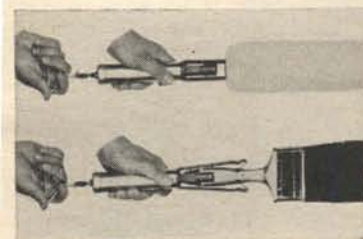
Showcase



CHANGE COLOR in this ball-point pen with a flick of the finger. Four colors, black, blue, red and green are included; spare refills are 50 cents for set of four colors. Fine for students, accountants, nurses, technicians or for anyone who likes to get some variety of color in his writing. Pen is precision made, chrome plated, has money-back guarantee. \$2.98 from A. B. Larsen Imports, Dept. W, 1549 Sherman Ave., North Bend, Oregon.



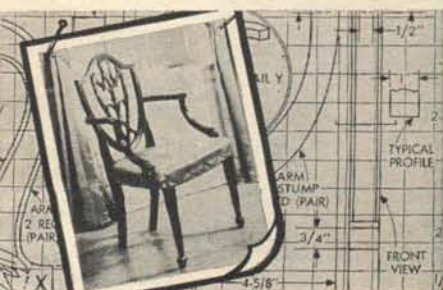
INCLINOMETER MEASURES angles directly and instantly. Inexpensive instrument has simplified dial reading, is accurate to $\frac{1}{2}$ of 1 degree. Weighs 1 lb., looks like small desk clock, stands on grooved base. Unit is unaffected by extreme heat or cold, takes rough handling. Replaces bulky levels, adjustable triangles. Exact readings from 0 to 90 degrees. For information: Pro Products, Inc., P. O. Box 1955, Rockford, Ill.



FAST CLEAN-UP for paintbrushes and rollers is assured with this unit that spins brush or roller to remove paint and cleaner. Just a few pumps on the handle does the job. Brush or roller is fitted in Mira-Twirl, then dipped in solvent and spun in empty container. Unit is all-steel construction with ball bearings. At hardware stores or by mail from Mira-Twirl, P. O. Box 4455, Detroit 28, Mich. \$3.69.

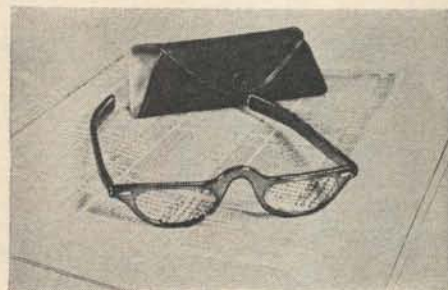


COMPACT SAW GRINDER handles circular blades from 4 to 20 in. dia. Lightweight, easily mounted on bench or table, unit is rugged enough for professional use, handy enough for home craftsmen. The handy 12-lb. compact unit is ready to use, comes complete with grinding wheel, dressing tool, bench mount, heavy-duty 110-volt motor. Price is \$59.95; money back guarantee. For details: Holst Mfg., 3111 Cricklewood Ave., Torrance, Calif.



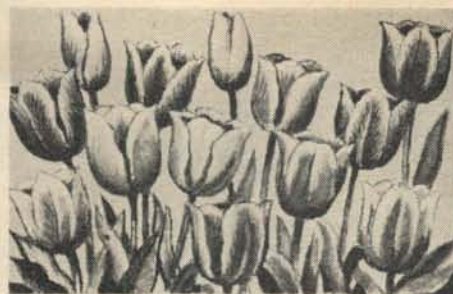
Authentic Period Reproduction

For the craftsman interested in the unusual, these unique full-size plans re-creating the famous Hepplewhite chair are the answer. These pre-tested plans were taken directly from the original (dating back to 1790) which has been preserved in a museum. Full instructions are included showing how to make this exquisite piece of furniture with or without arms. Full set now only \$3.00. Write: Hepplewhite, 543 Westport Rd., Kansas City, Missouri 64111.



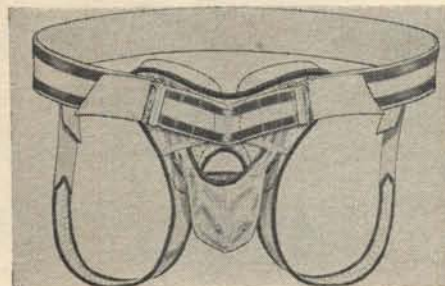
Magnifying $\frac{1}{2}$ Frame Glasses

Half-frame design lets you see Sharp and Clear for reading fine print and doing detail work yet allows you regular non-magnified vision over the top of the lenses. $2\frac{1}{4}$ diopter polished ground lenses. For folks over 40 without astigmatism or eye disease who simply need magnifying lenses. \$3.98 postpaid includes case. Satisfaction guaranteed or money back if returned ppd. in 30 days. Nel-King Products, Dept. WB-94D, 811 Wyandotte, Kansas City, Mo. 64105.



100 Imported Tulip Bulbs . . . \$1.98

100 Healthy hardy med. size ($2\frac{1}{2}$ " circumference) Denmark fall planting stock tulips only \$1.98 (200 only \$3.79). 6 Dutch Muscari bulbs, lovely blue, Free of extra cost. Ass't colors, varieties. Guar. many blooms 1st season, normal bloom 2nd season and for 5 years or replacement free. If C.O.D. postage extra. Cash orders 40¢ and we ship ppd. Satisfaction or return in 10 days for purchase price refund. Michigan Bulb Co., Dept. MG 1608, Grand Rapids, Mich. 49502



Suspens-O-Truss

Now—Two-way rupture relief. You can enjoy the relief and comfort of a new truss design for reducible inguinal hernia combined with the added ease and security of a cool, comfortable suspensory. Flat foam rubber pad shaped to fit snugly under abdominal bulge. Elastic body belt. Send hip measurement. Only \$6.98 plus .25¢ postage. Satisfaction guar. or money back if returned ppd. in 30 days. Kinlen Co., Dept. WB-94T, 809 Wyandotte, Kansas City, Mo. 64105.



Heatform Fireplace Unit

A double walled metal unit with air chambers surrounding the firebox and upper throat, captures and circulates heat lost up the chimney by the ordinary fireplace. Complete unit, hearth to flue, perfect guide for masonry walls of a fireplace, eliminating construction errors and smoke trouble. Write for complete "do-it-yourself" literature. Superior Fireplace Co., Dept. WB-H, 4325 Artesia Ave., Fullerton, Calif., or Dept. WB-H, 601 N. Point Rd., Baltimore 6, Md.



ENLARGING A Family Room

When one home owner decided to enlarge a narrow, quite dark family room, Figs. 1 and 8, he did it by taking space from the adjacent, attached two-car garage. The home owner noted that there was space between the edge of the garage door and the wall of the family room. Dropping a plumb line on the outside edge of the door track, Fig. 5, showed the space to be exactly 47 in. wide. This meant he could add almost 72 sq. ft. to the room, and still park cars in the garage. (No, you cannot open the righthand doors of the car parked in the righthand stall.)

A scale drawing of the existing room first was made, then the proposed new room was planned over it, Fig. 6. As indicated by the drawing, the original arrange-

ment required that you first go out a door in the family room, Fig. 8, to the garage, to go down the basement steps that were open to the garage. With the wall moved out, the steps were inside the family room. It was determined to remove the wall between the family room and the stairway, which meant a railing would be required. To provide the railing the existing wall was cut down so that its finished height would be 3 ft. A double 2 x 4 header was spiked to the tops of the shortened 2 x 4s in the wall and a straight-grained length of 2 x 6 then was nailed over the headers to provide a finished appearance. This wall was not finished, however, until the new floor was installed. In the process of cutting down this wall it was determined that a narrow closet could be installed above the stairway, so a portion of the wall was left full length from floor to ceiling and a door framed in it, Fig. 9.

Next step in the project was to go into the garage and tear off the plasterboard along the lower edge of the family-room wall to determine the floor height. A frame of 2 x 8s, (same as other joists in the house),



1. Original room, looking at southwest corner. Window in west wall, at the right, was only one in the room.



2. Same shot as in Fig. 1, during remodeling. Window has been moved, plasterboard is up and joints taped.



3. Looking toward northwest corner of room shows new window installed. At left is edge of new floor section.



4. Southwest corner after job is complete. Trim is fitted between wall and ceiling, in corners and at base of wall.

was spiked together and blocked up on lengths of 4 x 4 on the garage floor. Second-course shingles were used to shim and level the ladder-like assembly. It then was spiked to the 2 x 8 that boxed in the existing floor joists, and to the adjacent, (back) wall of the garage.

The weather was mild, (and construction was inside the garage), so the wall next was torn down. Most of the insulation and the 2 x 4 studs were salvaged for re-use. Had the weather been cold, (most garages are unheated), it would have been better to first build the new wall, then tear down the old; also somewhat more expensive. The cut-down wall on the east now was lengthened a couple of feet and the end studs were extended down between the joists of the new floor and spiked in place. This added strength to the wall assembly.

Two 4 x 10-ft. lengths of $\frac{5}{8}$ -in. plywood, (same thickness as on the existing floor), now were cut and fitted over the floor joists, but were not nailed down. The plywood provided a working platform and provided a safety factor so members of the family, as well as curious visitors, (you get them with a remodeling project), would not fall through the joists. The new wall was built, the bottom plate being spiked directly to the joists. It could have been spiked through the plywood floor, but there was still work to be done under the floor, and the builder wanted to close in the room in case of cold weather. An opening was framed in the wall for the door that originally had led to the garage from the family room, as in Fig. 8. The door was set down to the level of the garage floor, thus could open under the curve of the garage-door track, Figs. 7 and 12. Batt insulation was stapled to the studs of the new wall, then both sides were covered with plasterboard. During construction of the wall two receptacles were installed, and the garage-door track was lag-screwed to a 1 x 4 spiked to the wall, Fig. 7.

A window now was installed in what had been the blank, exterior wall over the basement stairway. This wall had not been insulated in the original construction, so all plasterboard was removed at this time, and after the window was fitted in place the wall was insulated and covered with plasterboard. By driving the nails through the plasterboard with a nail set it was possible to salvage some of the original material. In the opposite end of the room, in the west wall, it was necessary to remove about 4 ft. of plaster-



5. To determine maximum space that could be used, a plumb line was dropped outside the edge of door track.

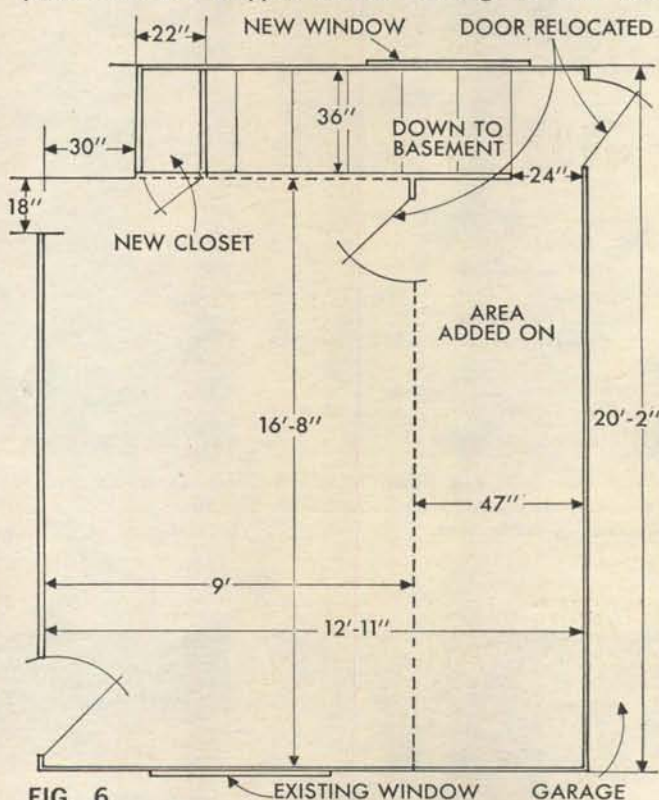
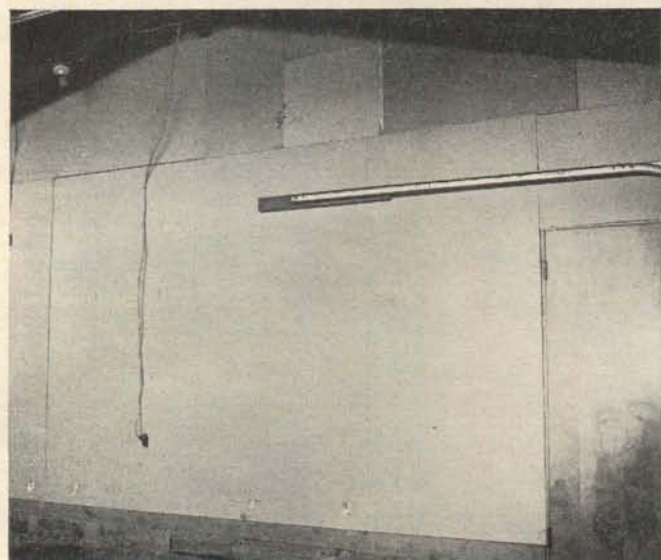


FIG. 6

board and insulate the portion of the wall that had originally been in the garage. During this phase of construction the window in the west wall was moved over to be centered in the new, wider span of wall. Additional receptacles were installed, being wired from the basement below, and under the new floor.

All plasterboard not yet finished was taped, nails were dimpled and plastered over and necessary repairs made. As indicated in Figs. 2, 3, 12 and 13, much of the taping and plastering was done as construction progressed. Next step was to lift the plywood from the new floor and staple batts of insulation near the lower edges of the joists. Two existing heat ducts



7. Door track was hung from ceiling by wire during construction, then was screwed to 1 x 4 strip on wall.

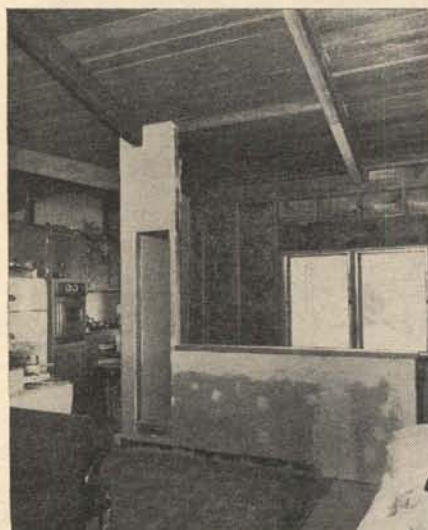


8. East end of room had blank wall, making this area quite dark; lights were used most of the time.

were extended with 4-ft. lengths of ducting and the registers relocated next to the new wall. The ducts were above the insulation. The plywood floor now was nailed down solidly.

With the room structurally complete, draft-tight and soundproofed it was time to add the glamor. Masonite Royalcote paneling was used on the walls. Two of the walls in this room varied in height from 9 to 14 ft. because of the open, beamed ceiling. Although the paneling is available in 10 and 12-ft. lengths, the builder used 8-ft. panels. They were easier to handle than the longer panels, and it was easier to fit short lengths of paneling between the 8-ft. lengths and against the slanting ceiling and around the beams. Finishing nails were used on most of the panels, nailing through the plasterboard into the studs. Where the walls were somewhat irregular, however, contact adhesive was used, Fig. 14. A door for the closet was built from 1 x 2s and the paneling, Fig. 10. Because a breakfast bar made a narrow passage here, the door of the closet has no projecting knob. A latch of the type that is pushed to open and pushed to close was installed inside the door.

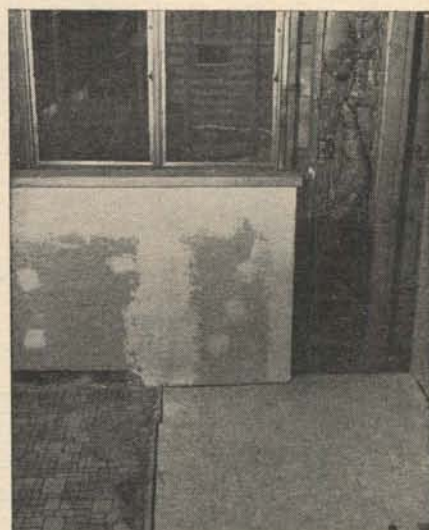
When installing panels over receptacles, they first



9. When wall was cut down to make rail, closet-door opening was framed in. Light color is from wall.



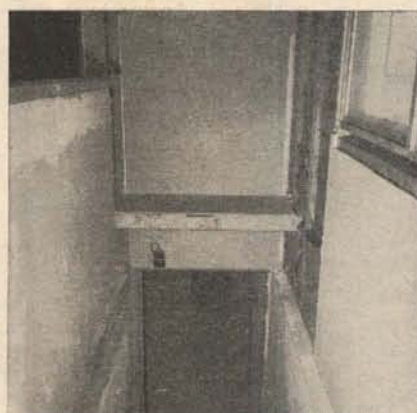
10. Door for closet was made from paneling and 1 x 2s. To eliminate hip-bruising knob, "Push-Latch" was used.



11. Cut-down wall was extended a couple of feet, opening left to go down basement stairs.



12. This view shows cut-down wall, new wall at right and floor extension covered with $\frac{5}{8}$ -in. plywood.



13. Shot looking down basement stairs with cut-down wall at left. Platform for closet floor is plywood nailed to 2 x 4s.



14. Locations of 2 x 4 studs were marked for nailing paneling. In some areas contact adhesive also was used.



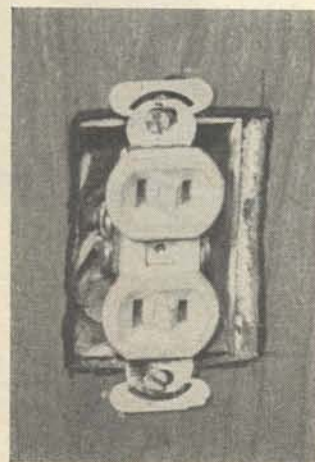
15. Two bookshelves above stairway, on wall of closet, provided more valuable storage.

were loosened from the boxes, then the panels, with an opening cut for the boxes, were fitted in place. When the receptacles were refitted, Fig. 16, they helped hold the panels. All nails were set and the heads covered with Putty Stik, Figs. 17 and 18. At this time most of the base, and inside and outside corner trim was cut and fitted, Figs. 23 and 24. Trim near the lower part of the walls was not installed until after the floor was finished.

The edge of the existing floor, Fig. 11, was so irregular it was impossible to get a really close fit with the plywood. This opening now was filled with splinters, blocks where necessary, finally an epoxy resin mixed with sawdust. The resin was the type



16. Receptacles were loosened in boxes, then paneling with opening cut to fit was installed.



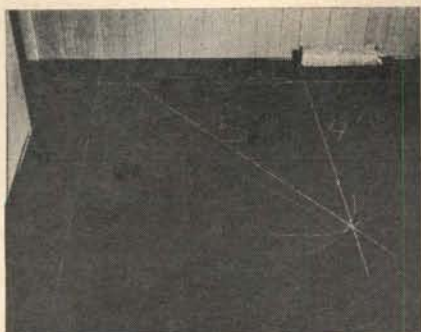
used to seal cracks in basement walls. When this had set the inlaid linoleum on the old floor was scraped off and the floor sanded with a floor sander to remove the remaining felt and adhesive. The resin also was sanded smooth and flush. To minimize irregularities, building felt now was glued to the floor, the edges of the strips being butted. Both before and after the felt was installed a shop-type vacuum was used to thoroughly clean the floor, Fig. 20. A "3, 4, 5 layout" was chalked in one corner of the room to strike off a right angle, Fig. 19, and the first two rows of floor tile were installed at right angles, Figs. 21 and 22. Once the first two rows of tile, Armstrong Vinyl-asbestos was used here, were installed, the rest of the



17. Small finishing nails, per instructions, were used to attach paneling, then heads were covered with Putty Stik.



18. After applying Putty Stik a soft cloth was used to buff the spot over each nail. Spot is above cloth; almost invisible.



19. Floor was covered with building paper to smooth irregularities, then was marked to make layout for tile.



20. Before installing building paper, then before installing tile on top of building paper, vacuum was used.



21. Mastic was troweled on building paper for tile, rather than using brush-on adhesive.

floor went quickly. The home owner used a trowel-on mastic for the tile, rather than the brush-on. The latter is considerably more expensive and does no better a job of holding the tile.

All trim (prefinished, matching wood trim from Masonite), now was installed. The wall paneling had been cut and fitted so it stopped about $1\frac{1}{2}$ in. from the edges of door and window openings. The edges of door and window trim now was rabbeted $\frac{1}{4} \times \frac{1}{2}$ in. and fitted in place. The rabbet fitted over the paneling and let the trim fit snugly against door and window casings. This stunt also eliminated the problem that would arise if the paneling were to be fitted to the edges of the trim.

When the room was finished two shelves were fitted on the wall of the closet, Fig. 15, well above head height. These shelves can be reached from the railing.

It took the home owner a couple of months working evenings and weekends to complete the job, but the finished product, as shown on the cover, in the lead photo, and Fig. 4 is well worth the time and work involved. Other photos of the "before and after" of the room show what a determined do-it-yourself home owner can do to improve his property.

While your home may not fit exactly with the situation described here, take a look at your attached garage

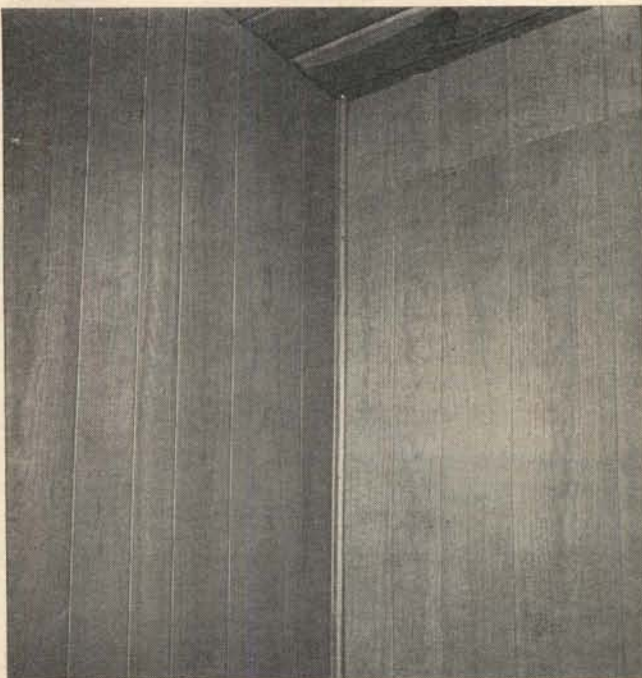
to see if you can get even a foot of extra space. And some of the other ideas can be modified for application in your home. $\Delta \Delta$



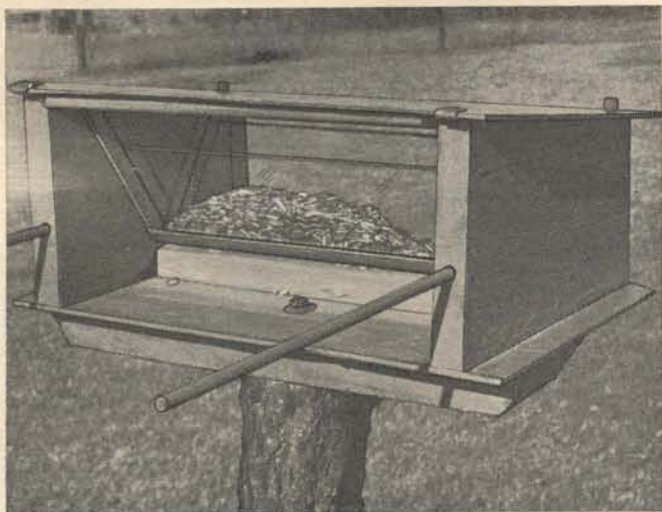
22. Once first two rows of tiles were positioned exactly at right angles, installing rest of tiles was quick and easy.



23. Prefinished base and outside-corner trim pieces were fitted before floor tile was installed; later nailed in place.



24. Inside corner trim was used in corners of room, also between walls and ceiling. Angled ceiling caused problems.



Two perches extend invitingly from the front of this large-capacity feeder that serves the birds from both sides.



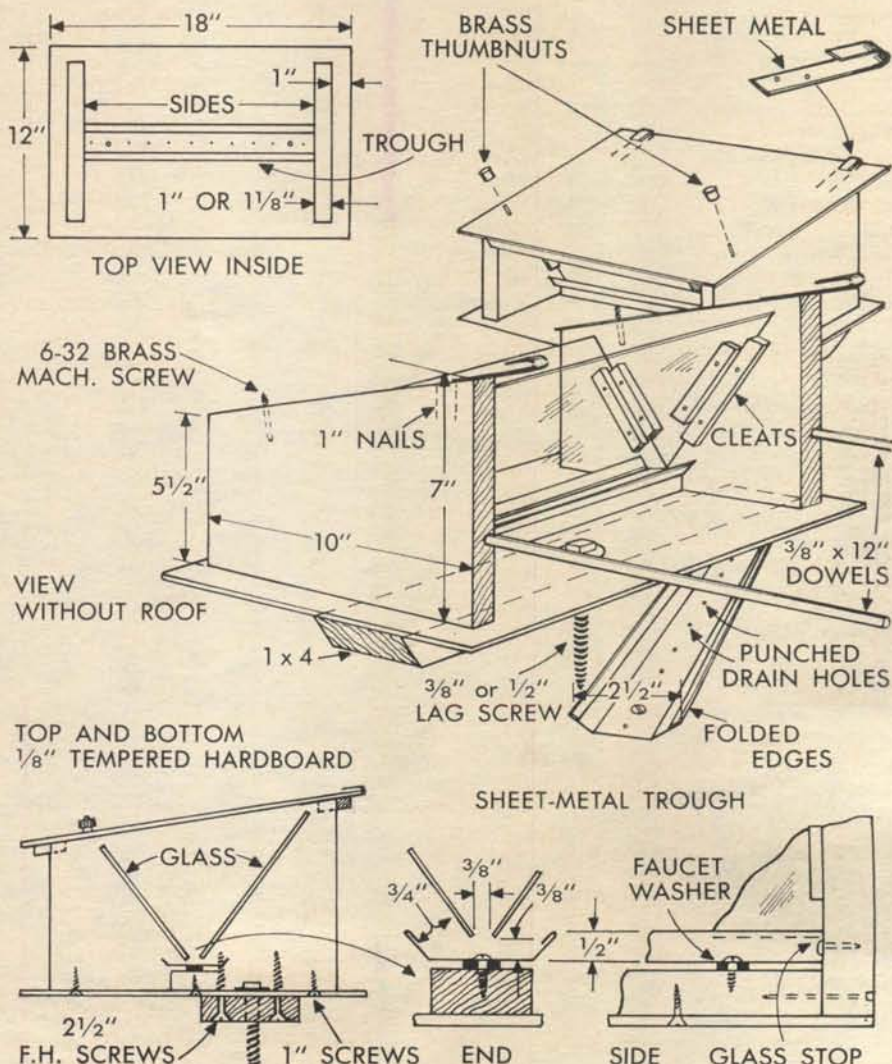
One glance at the glass seed holder shows if it needs re-filling. Roof is removed by loosening two thumbnuts.

RANCH-HOUSE BIRD FEEDER

Raising the roof enables you to re-fill this bird feeder quickly. The roof is held by two sheet-metal clips at the front and two thumbnuts near the rear. There are two reinforcing cleats on the underside. A single lagscrew holds the feeder on a post.

To make it you first cut the roof and floor, both the same size. Then cut the sides and attach the floor to them with 1-in. F.H. screws. Next, attach the support cleat under the floor, driving the $2\frac{1}{2}$ -in. screws into the sides. The sheet-metal feeding trough is $2\frac{1}{2}$ in. wide at the top and is $\frac{1}{2}$ in. deep. Fold the edges of the metal and punch holes through the bottom so water can drain out. Faucet washers slipped over screws raise the trough slightly above the cleat that holds it. The cleat is secured by nails driven through the sides and by screws through the bottom.

Two inclined pieces of glass form the seed holder. These extend from $\frac{3}{8}$ in. above the trough bottom almost up to the roof line and are held by small wooden cleats. The glass should be a sliding fit for easy removal. A roofing nail driven into each side serves as a stop to keep the glass from slipping down. The two perches complete the feeder. They are $\frac{3}{8}$ -in. dowels pushed into holes in the front edges of the sides a couple of inches above the floor. The latter should be screwed tightly to the sides to exclude water. The support cleat under the floor is located toward the front so the lag screw is readily accessible. $\Delta \Delta$



BEDROOM CHEST FOR MILADY

Second item in the bedroom set for the WORKBENCH Contemporary Collection is this chest for milady, designed by Don Cartner Associates as a matching unit with the man's bedroom chest shown in the last issue. Construction is very similar, the main difference being that the drawers are all the same size, rather than varying sizes as in the man's unit. The shirt bins have been replaced by a slack-and-skirt rack.

As stated for the man's unit, $\frac{3}{4}$ -in. hardwood-faced

plywood can be used instead of solid stock, which would eliminate the need for making tongue-and-groove joints in the various pieces that would have to be glued-up to make the doors, top, bottom and sides. Edges of all plywood panels that show should be taped with veneer, to provide the appearance of solid stock.

Be sure all hardwood used for the framing is furniture-grade, kiln-dried stock. If at all possible, after you have purchased the lumber, store it in the room

MATERIALS LIST

Fig. 1

$\frac{3}{4}$ " Hardwood

A, Frame, 1" x 40 $\frac{1}{2}$ ", 4 req'd.

B, Frame, 1" x 27-13/16", 4 req'd.

D, Drawer Guides, 1-3/16" x 18-1/16", 8 req'd.

E, Frame, 1" x 25-13/16", 2 req'd.

F, Facing, 1" x 40 $\frac{1}{2}$ ", 2 req'd.

G, Facing, 1" x 27-13/16", 2 req'd.

H, Facing, 1" x 25-13/16", 1 req'd.

1" Hardwood

C, Stringer, 1" x 16-9/16", 6 req'd.

$\frac{3}{4}$ " Hardwood

K, Base Frame, 3 $\frac{1}{2}$ " x 31", 2 req'd.

L, Base Frame, 3 $\frac{1}{2}$ " x 9", 2 req'd.

1 $\frac{1}{2}$ " Hardwood

M, Leg, 4" x 6", 4 req'd.

N, Base Dowels, $\frac{1}{4}$ " x 4", 8 req'd.

Fig. 3

$\frac{3}{4}$ " Hardwood

E, Side Panel, 7" x 29-5/16", 4 req'd.

F, Side Panel, 6 $\frac{5}{8}$ " x 29-5/16", 2 req'd.

G, Drawer Front, 6 $\frac{5}{8}$ " x 18 $\frac{5}{8}$ ", 4 req'd.

$\frac{1}{2}$ " White Pine

H, Drawer Sides, 6 $\frac{5}{8}$ " x 18-11/16", 8 req'd.

I, Drawer Back, 6 $\frac{5}{8}$ " x 18 $\frac{5}{8}$ ", 4 req'd.

$\frac{1}{4}$ " Plywood or Hardboard

J, Drawer Bottom, 17-9/16" x 18 $\frac{1}{8}$ ", 4 req'd.

Fig. 4

$\frac{1}{4}$ " Plywood or Hardboard

A1, Back Panel, 28-9/16" x 41 $\frac{1}{4}$ ", 1 req'd.

$\frac{3}{4}$ " Hardwood

A, Door Panel, 7" x 27-11/16"

B, Door Panel, 6-11/16" x 27-11/16", 2 req'd.

$\frac{1}{2}$ " Hardwood

C, Door-Pull Spacer, 1" x 5", 4 req'd.

$\frac{1}{4}$ " Hardwood

D, Door-Pull Plate, 2 $\frac{1}{2}$ " x 5", 4 req'd.

Hardware

E, Hinge, Continuous, $\frac{1}{2}$ " x 30" (open), 2 req'd.

F, Magnetic-Catch Strike, 1/16" x 1" x 13/16", 4 req'd.

$\frac{3}{4}$ " Hardwood

B, Top and Bottom Panel, 7" x 42", 4 req'd.

C, Top and Bottom Panel, 6 $\frac{5}{8}$ " x 42", 2 req'd.

1 $\frac{5}{8}$ " Hardwood

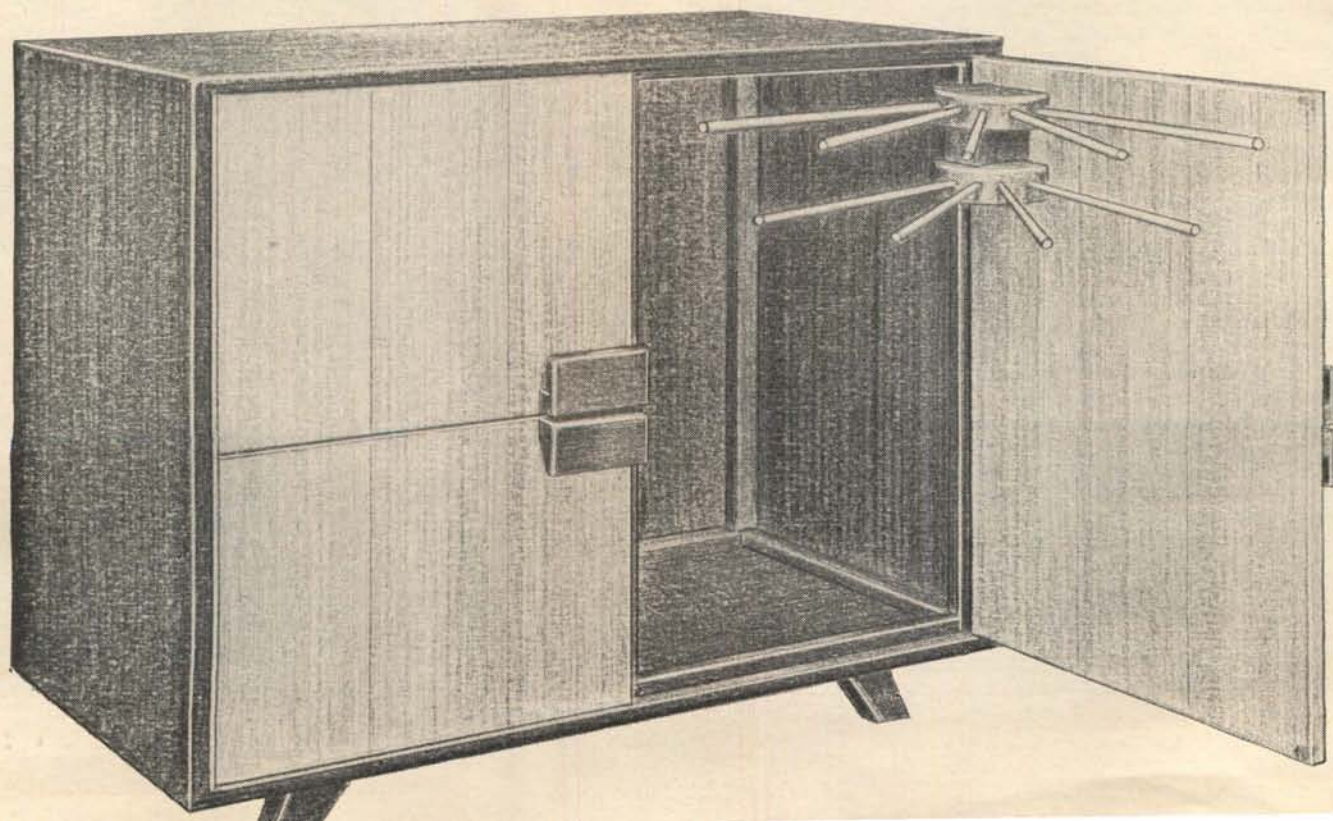
H, Quadrant, 3 $\frac{1}{2}$ " x 3 $\frac{1}{2}$ ", 2 req'd.

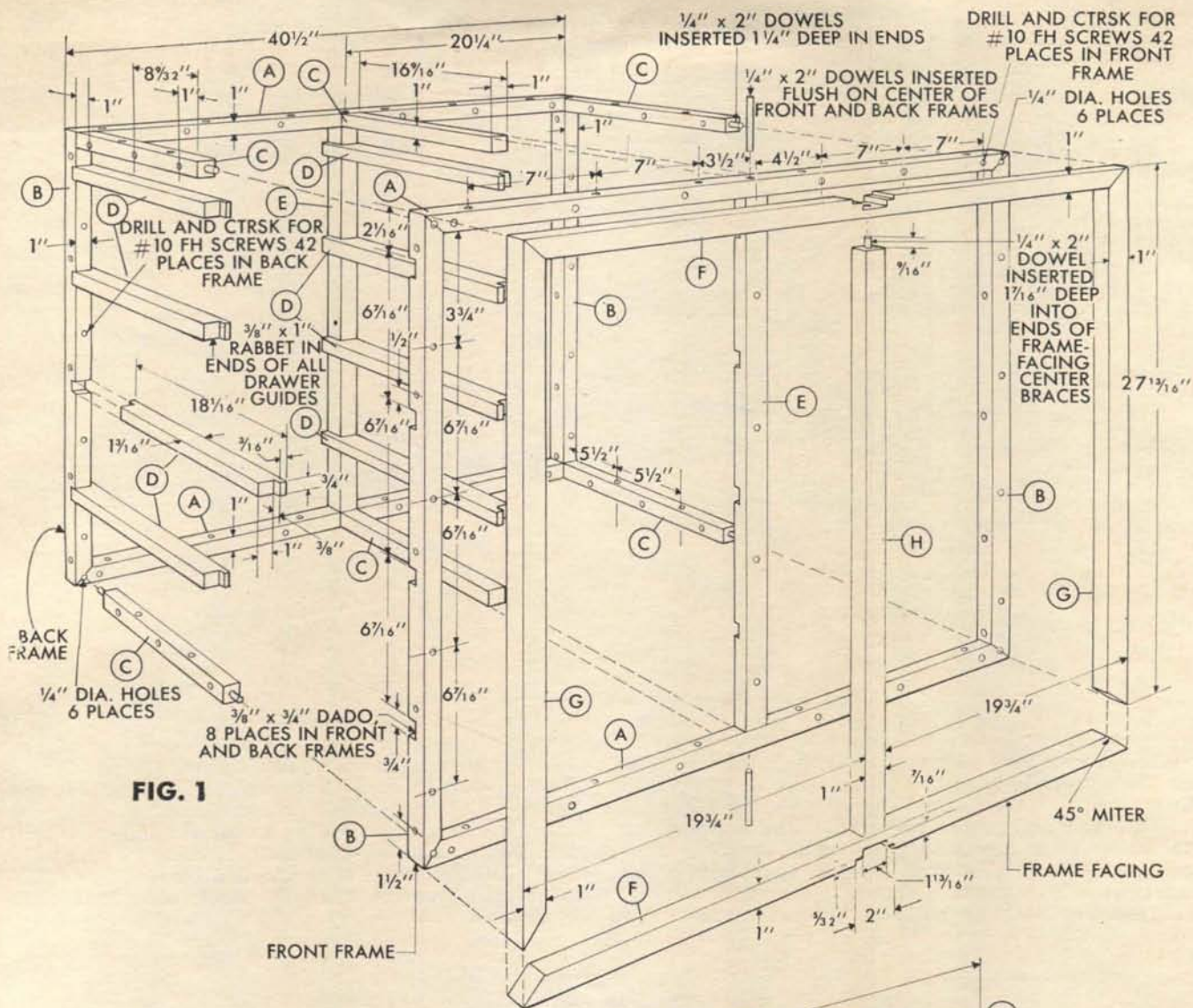
I, Quadrant Spacer, 2 $\frac{1}{2}$ " x 2 $\frac{1}{2}$ ", 1 req'd.

J, Quadrant Dowels, $\frac{1}{4}$ " x 4 $\frac{7}{8}$ ", 2 req'd.

Brass Or Aluminum Rods

G, Rack Rods, $\frac{1}{4}$ " Dia. x 15 $\frac{1}{2}$ ", 9 req'd.





in which the furniture will be used. (Yes, we know the wives will object.) The lumber will adjust its moisture content to that in the room, and furniture built from it will be much more dimensionally stable. Cut all pieces accurately. In cases where a number of identical pieces are required, as for the D drawer guides, improvise a jig to assure that all pieces are cut the same size.

Use a good-quality glue for all joints, and where dowels are used, either file a flat on them, or saw a shallow groove in each one. This is to assure that excess glue will be forced out, and that each dowel can be driven into the hole the required length. (Excess glue can prevent a dowel bottoming, which would require that the projecting portion of the dowel be shortened.)

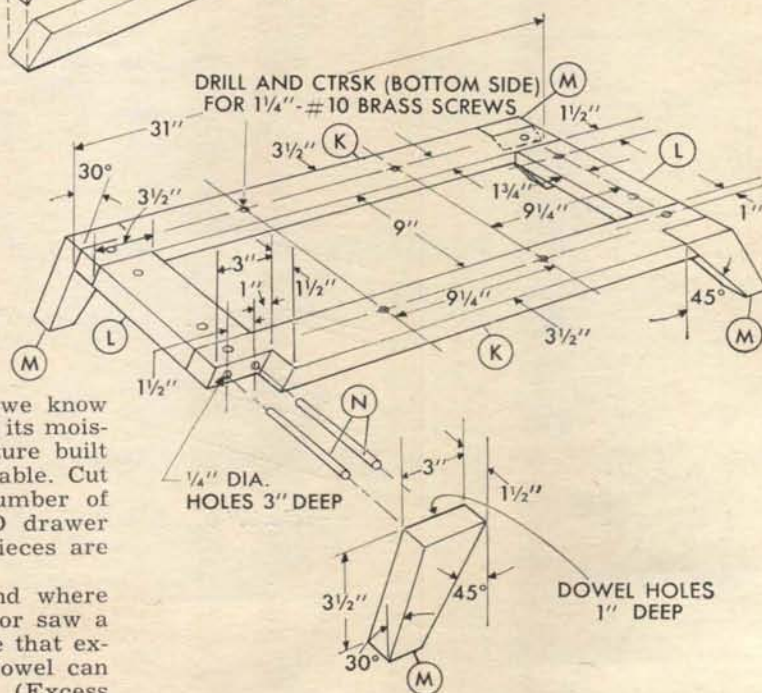
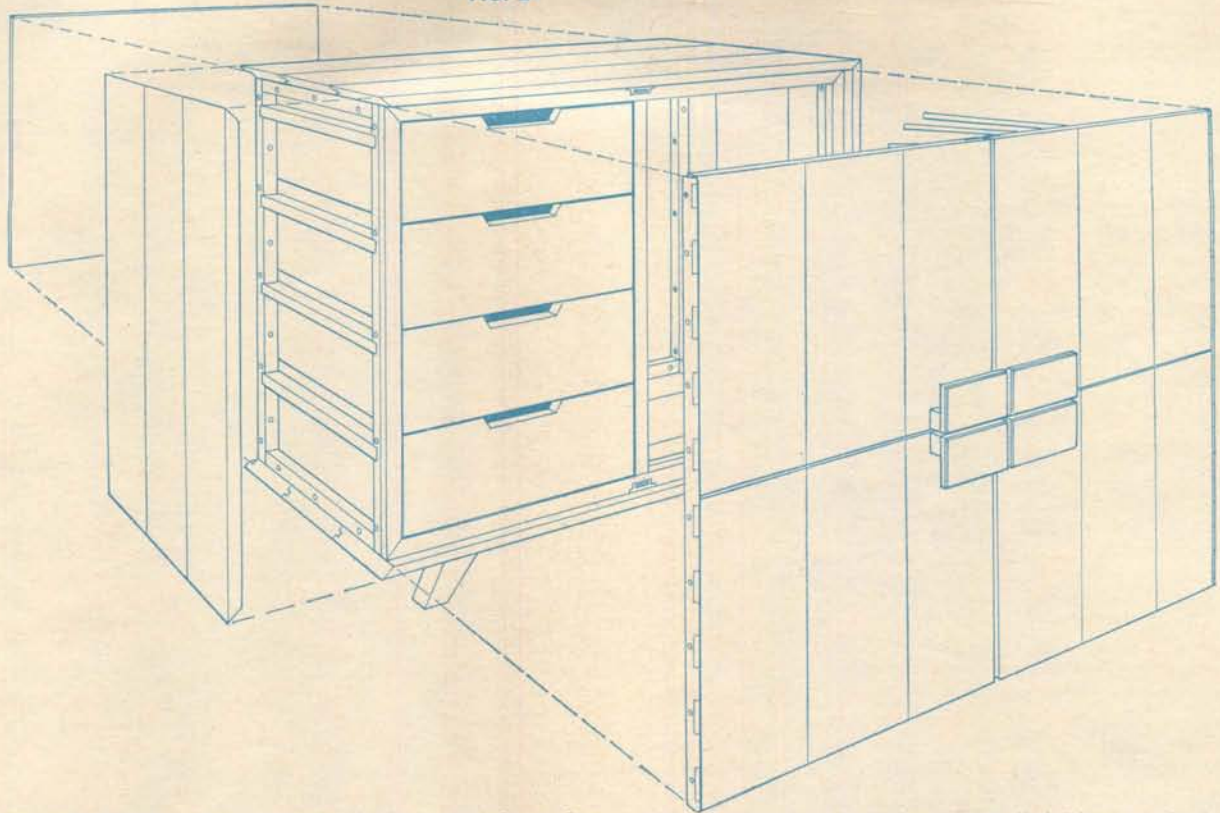


FIG. 2

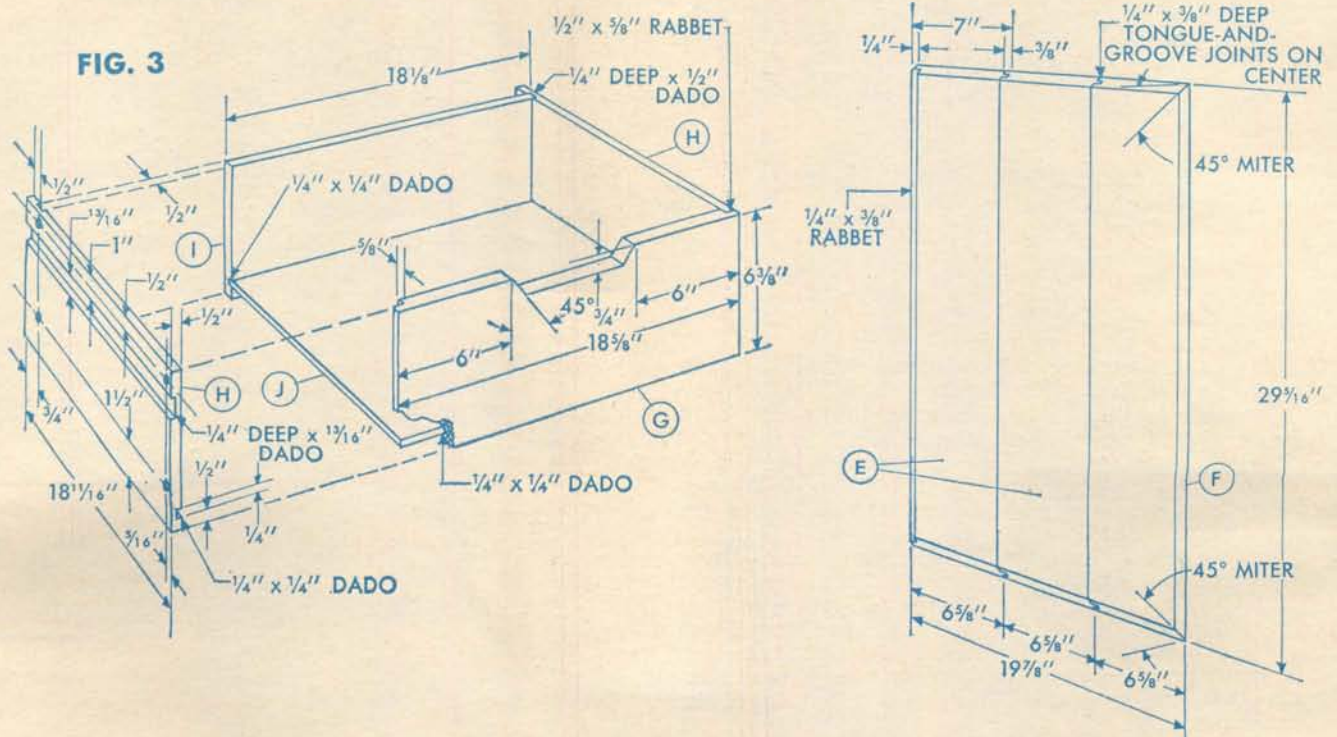


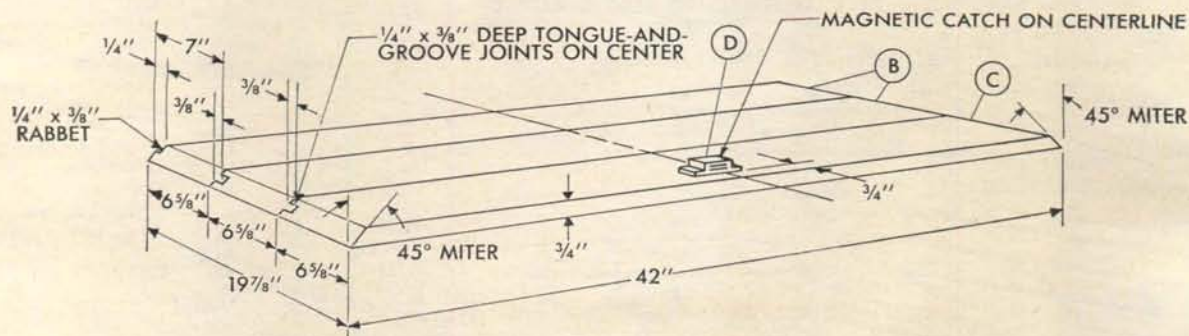
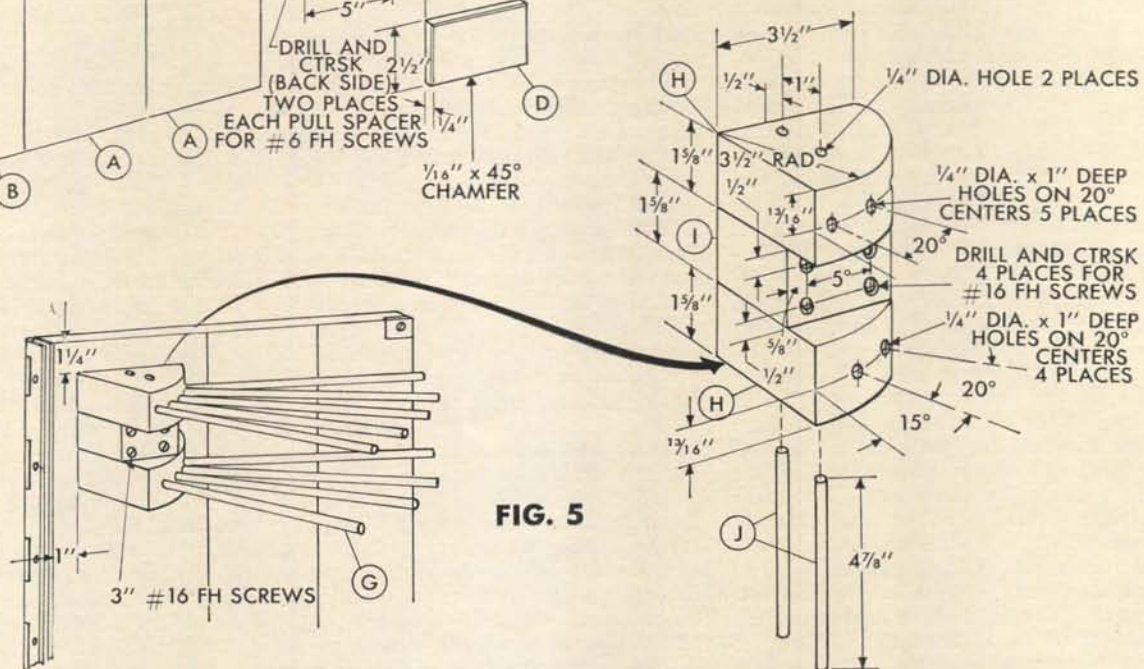
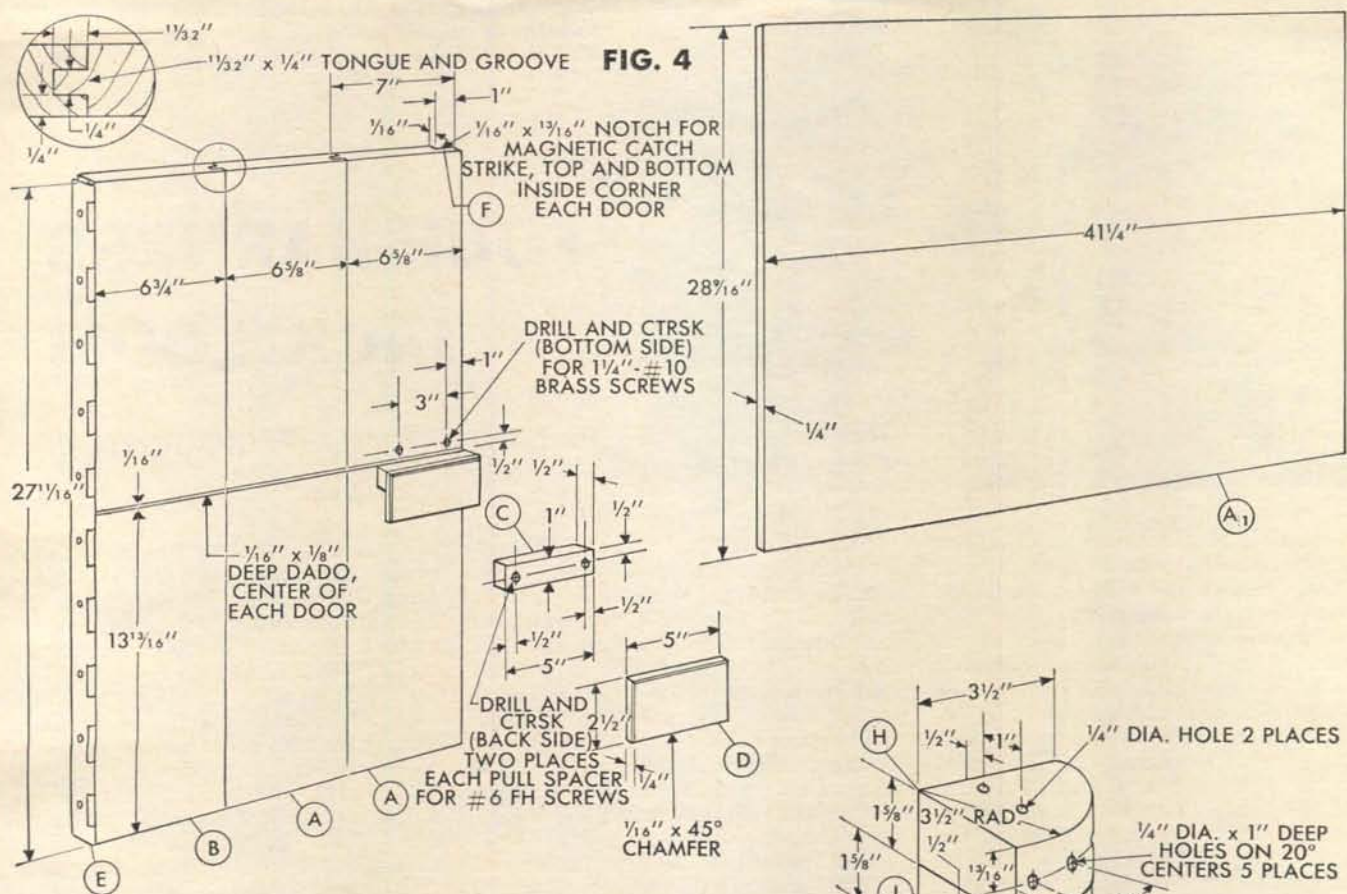
When assembling the various frame members be sure to square them up and clamp them securely until the glue is set. We recommend that you do not build the drawers until after assembling the frame. You then can check the dimensions between the guides, and if necessary, adjust the drawer sizes to suit any changes in the dimensions of your particular assembly.

If you are building both the woman's and man's

chest, be sure to use the same finishing methods and products on both items. They are a matching pair and should match right down to the finish. Construction details are clearly shown in the various drawings, and step-by-step assembly is almost the same as the man's chest that was featured in the last issue. The continuous, (piano) hinges should be steel, brass-plated for appearance. $\Delta \Delta$

FIG. 3







1. "Throwing" the shuttle through a "shed" formed by raising some of warp with a treadle. Shuttle is supported by shuttle races.

FOUR-HARNESS JACK LOOM

Part II

ENNO R. HAAN

This installment details a number of accessories you will need, and briefly explains how to dress the loom and start weaving.

For a six-treadle jack loom, as detailed in Part I, you will need 540 10-in. heddles. The size of a heddle is the center-to-center distance between the eyes at the ends. The flat-wire type shown in Fig. 2 cost about \$1.50 per hundred. The end eyes engage the steel heddle supports, and the center one holds the warp thread. To install heddles on harnesses you disengage one end of the steel heddle supports and remove the hooks temporarily.

The cross threads or yarn, called "weft", are held on shuttles. You will need as many shuttles (or bobbins of bobbin-type shuttles), as the number of colored weft threads to be used in a weaving project. Fig. 3 shows the simplest kind of shuttle; a thin, flat stick about as long as the width of the fabric. This shuttle is pushed through the shed rather than "thrown". Fig. 4 shows a shuttle used for heavy yarn and is called a rug shuttle. It can be thrown. To do so, you rest it on the shed floor as in Fig. 1, then give it a quick push to propel it through the shed, catching it with the other hand as it emerges. A length of weft a little longer than the width

of the fabric is unwound before throwing the shuttle.

A bobbin-type shuttle, Fig. 5, is speedier to use for finer weft, as the thread unwinds automatically. Bobbins are wound with a bobbin winder or by means of a small motor having an extension shaft to hold the bobbin. All shuttles should be sanded very smooth and given a few coats of lacquer or varnish, then waxed so they will glide easily over the warp.

For threading the loom you need a rack to hold the spools of warp. The 36-spool rack shown in Fig. 8 has removable wires passing horizontally through a number of uprights.

A warp-thread guide, Fig. 15, consists of a small piece of tempered hardboard, fiber or metal, $\frac{1}{8}$ in. thick, having a number of $\frac{1}{8}$ -in. holes drilled equidistantly in vertical and horizontal rows.

A temple, Fig. 9, is helpful for beginners to keep edges of heavy fabric such as rugs from being drawn inward while weaving and forming a "waist". In use you press the point at the ends into the edges of the fabric, push the temple down flat and turn the turnbutton to hold it. The use of a temple should be avoided on fine fabrics, as it leaves telltale holes.

A suitable stool or bench enables you to have both feet free for operating the treadles. Its height should be approximately 26 in., but can be varied to suit the user. A bench having convenient pockets at its ends is shown in Fig. 10. The tapered wooden legs are purchased. They turn into steel plates screwed to the underside of the bench.

The arrangement and number of warp threads for weaving patterns are given in printed or drawn threading drafts. These are read from right to left—the same order in which the warp ends are to be installed in a loom. The right side of a loom is your right side when facing it at the breast beam.

Fig. 12 shows a portion of a standard modern draft. The horizontal spaces which are numbered at their right represent harnesses, No. 1 being the harness closest to the breast beam. Each vertical row represents a single warp end and the markings indicate the harness that controls it. The squares formed by the horizontal and vertical lines may be blocked in solidly, contain a cross, circle or other symbol indicating the color of the warp.

There are other styles of drafts also with which you should become familiar. In most of these the harness numbers are placed in the

**WIRE HEDDLES
FIG. 2**

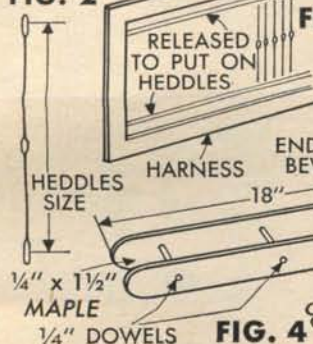


FIG. 3 NOTCHED FLAT SHUTTLE

FIG. 5 BOBBIN-TYPE SHUTTLE

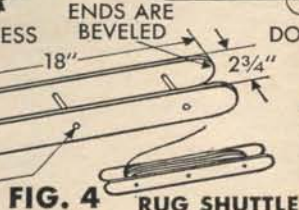
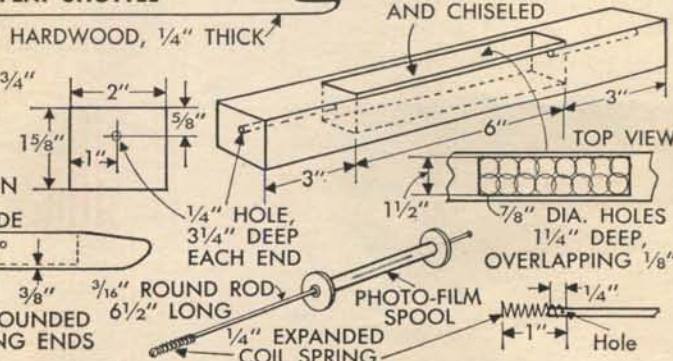
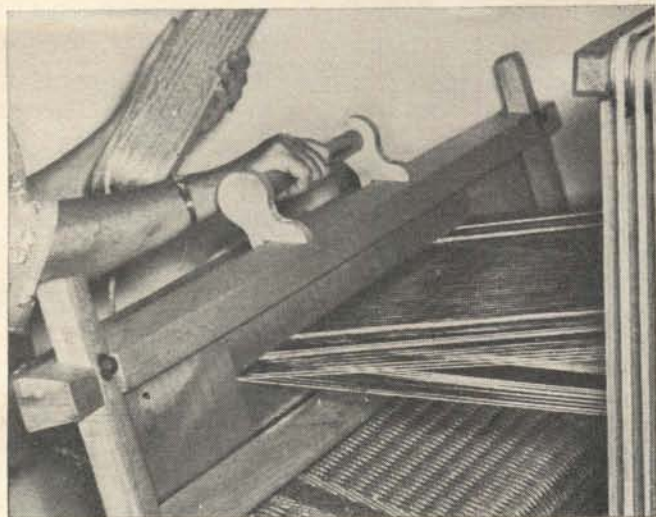


FIG. 3 NOTCHED FLAT SHUTTLE





6. Pulling beater toward breast beam, shed still open after throwing shuttle wedges weft between upper, lower threads.



7. Before beating down weft, you carefully adjust extending double portion of weft along edge to produce straight edge.

spaces, which is helpful in avoiding errors, especially when threading looms having more than four harnesses. A symbol close to each number indicates the color of the warp. In Scandinavian drafts the numbering of the harnesses is reversed, No. 1 being the closest to the back beam. A draft usually is given in its entirety; if not, you repeat what is given.

The standard treadle tie-up, (connection from treadles to harnesses), for a six-treadle jack loom is shown in Fig. 13. The crosses in the circles indicate the connections. If the tie-ups for a weaving project differ from this, it is usually given with the threading draft.

The treadles are identified by numbers and letters. The numbered treadles produce the weaving patterns of which an example is shown in Fig. 11. The lettered treadles produce a plain weave or "tabby" weave, as shown in Fig. 14. The treadle tie-ups often are arranged

so the treadles can be operated in a "walking" motion as follows: No. 1, left foot; No. 3, right foot; No. 2, left foot; No. 4, right foot.

To determine the number of warp threads to be wound in each section of the warp beam for fabric as wide as the reed (called "dressing" the loom), you divide the total number of warp ends by the number of sections of the warp beam. For fabric of lesser width you use as many sections as are about equal to the fabric width, planning the work to be centered in the loom. Then divide the number of warp ends used for this width by the number of sections.

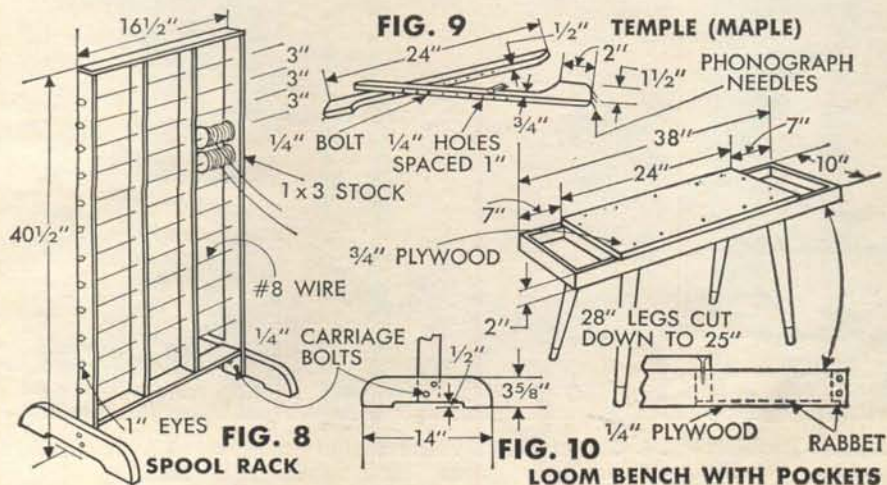
Reeds of 12 or 15 dents per inch produce a rather coarse weave but can be used for a fine weave having twice or triple the number of warp threads per inch. To do this, two or three warp threads are run through each dent, although a single heddle is used for each.

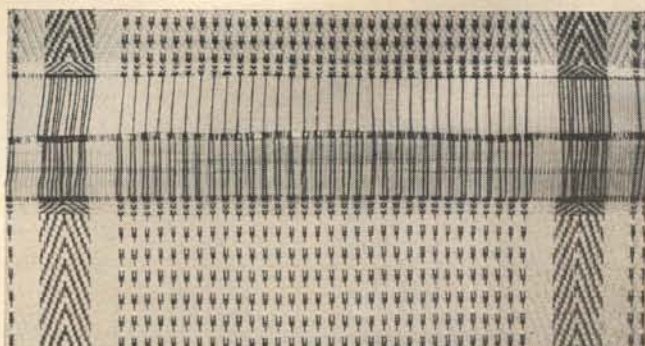
To transfer warp from spools to

the warp beam, you set up the spool rack a few feet behind it. Place spools on the rack from top to bottom, starting at the right top corner, in the same order as that in the threading draft. Then run as many threads through the warp-guide plate as are to be wound in the first section of the warp beam. The first section is the one in line with the right edge of the fabric. Set the guide plate in the slot of the back beam directly above the section to be wound. After bringing warp threads through the guide, tie them together as shown in Fig. 16. Then slip the knot through the chalkline loop on one of the cross bars.

Next, release the brake on the warp beam and rotate the beam with the crank in the direction indicated by the arrow in Fig. 16. The length of warp to wind depends on the project. For example, a job of weaving ten rugs, each 62 in. long (including allowance for shrinkage), will require 620 in. of warp plus the excess from warp beam to apron (about 6 ft.), making a total of about 58 ft. As each complete turn of the warp beam of this loom equals 3 ft., you will require 20 turns of the beam for the ten rugs. Wind the warp taut. To do so, grasp the collection of threads, referred to collectively as a "bout", with one hand while turning the crank with the other.

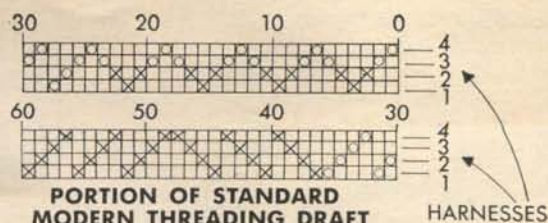
After winding, cut and tie a slip knot at the finish end of the bout and fasten it temporarily to one of the dowels to hold it in place. Wind successive sections the same way and in accordance with the threading draft. If the second section is an exact repeat of the first, you need not rethread the guide. If the requirements are different, you rethread the guide. Be sure to wind





11. Two rugs joined; note weaving design, also use of strips of cardboard to assure enough warp to form a fringe.

FIG. 12



O = WHITE WARP X = BLACK WARP

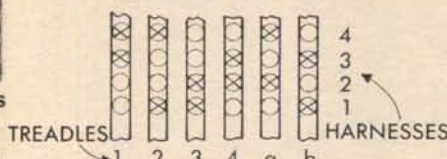


FIG. 13 STANDARD TREADLE TIE-UP FOR JACK LOOM

FIG. 14 TABBAY WEAVE



FIG. 17 TYING WARP TO APRON

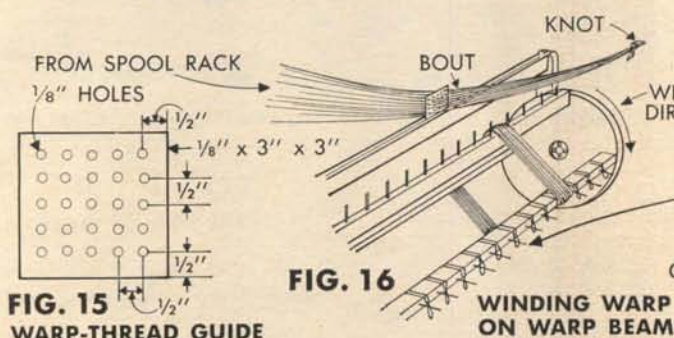


FIG. 15 WARP-THREAD GUIDE

FIG. 16

WINDING WARP ON WARP BEAM

all sections the same number of turns; if one section is short, the entire weaving project will be short.

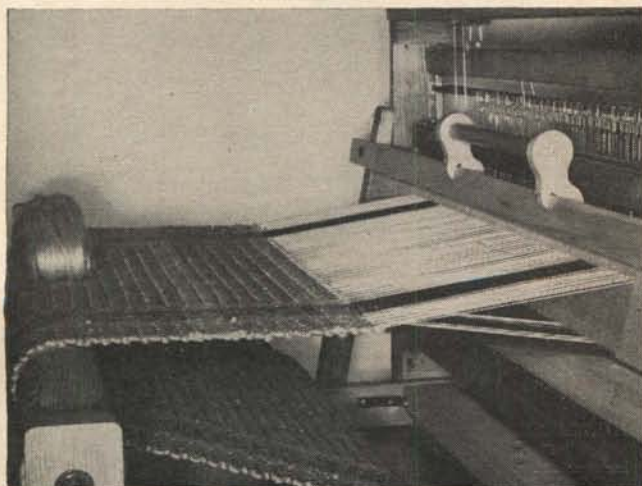
After all sections have been wound you pull the first bout under and over the back beam toward the harnesses. Loosen the slip knot at the first section, arrange the threads side by side in the order given in the draft, and use removable tape to stick them temporarily to the top of the back beam in this order. Then you pass the farthest thread at the right, and successive ones in proper order, through the heddles. As soon as the first bout has been brought through

heddles you again tie the loose ends together with a slip knot. Continue in the same way with the other bouts.

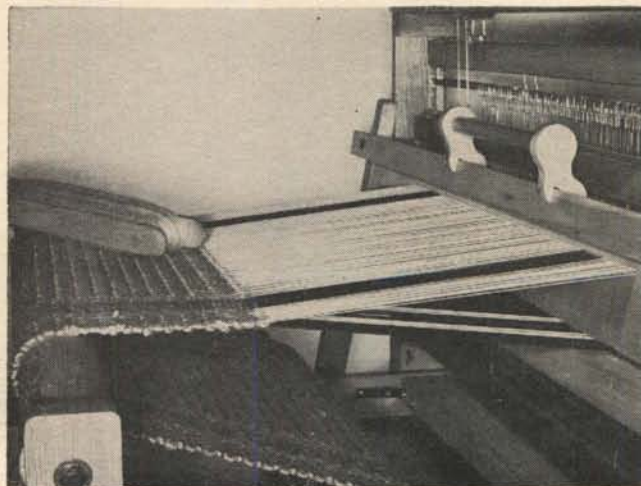
When all of the bouts have been brought through the heddles you start threading the warp through the reed at the right side, progressing toward the left, according to the sequence given in the draft. The first thread goes through the reed a distance from the reed center equivalent to half of the fabric width. A threading hook will facilitate the work. When all the bouts have been brought through the reed and the ends are tied with slip

knots as before, you set the brake and start tying the warp to the apron which is brought over the breast beam. The starting point is figured the same way as the starting point on the reed. Divide the first bout into two equal parts for tying them through two adjacent slits of the apron. The two steps of tying each of these are shown in Fig. 17. It is highly important to tie the warp to the apron so that all the threads will be uniformly taut.

When starting to weave, first use treadles "a" and "b" alternately to weave in strips of cloth from 1 to 2 in. wide instead of using the



18. As weaving progresses the shed gradually becomes smaller, tending to interfere with proper use of the shuttle.



19. Size of shed is restored after each few inches of weaving by winding up some fabric on the cloth beam.

regular weft. This is to produce a straight foundation for weaving. Weave the foundation 2 or 3 in. wide.

Weaving with regular weft on a shuttle is done as follows: Depress one treadle to form a shed, pass the shuttle through it and while the treadle is still depressed, pull the beater toward you. Then depress the next treadle, pass the shuttle in the opposite direction and beat again. Sequence of treading depends on the treadle tie-up. In beating, Fig. 6, a couple of light taps are better than a single hard one.

For a rug you can use coarse cloth for the foundation. If the rug is to have a fringe, the width of the foundation should equal the fringe width. Removal of the cloth strips later leaves the warp extending. After weaving the foundation for a rug you weave the heading, using a carpet cord for weft. The heading should be from $\frac{1}{2}$ to $\frac{3}{4}$ in. wide if there is to be a fringe, and $1\frac{1}{2}$ to 2 in. wide if the end is to be bound. After the heading you start pattern weaving with treadles 1 to 4, using weft as planned.

After each throw of the shuttle and before beating, adjust the doubled end of the weft as in Fig. 7 to produce a uniformly straight edge. Avoid pulling the weft too tightly with the shuttle as this draws in the edges and forms a waist. Allow the weft to cross the shed at a slight diagonal before beating, which helps prevent a waist.

When changing to a different color of weft, taper the starting and finishing ends and double those portions when joining them at the edges of the warp. After weaving about 5 or 6 in. on a large loom, less than this on a smaller loom, and the shed gradually becomes smaller, as in Fig. 18, you release the brake and wind up 5 or 6 in. on the cloth beam. Then set the brake again, pull the warp up taut by turning the cloth beam a little more. The shed will then be larger again, as in Fig. 19, and you can proceed with the weaving. These adjustments are made repeatedly.

In finishing a rug you add a heading as you did at the starting end, and then allow for fringe if this is desired. However, instead of weaving in more cloth strips you can substitute two strips of corrugated cardboard, each as wide as the fringe, as shown in Fig. 11. One of the strips is for the finishing end of the first rug, and the other for the starting end of the second. When a rug is removed from the loom you tie the fringe warp tightly against the heading in groups of six threads each. Then trim the fringe to uniform width. $\Delta \Delta$



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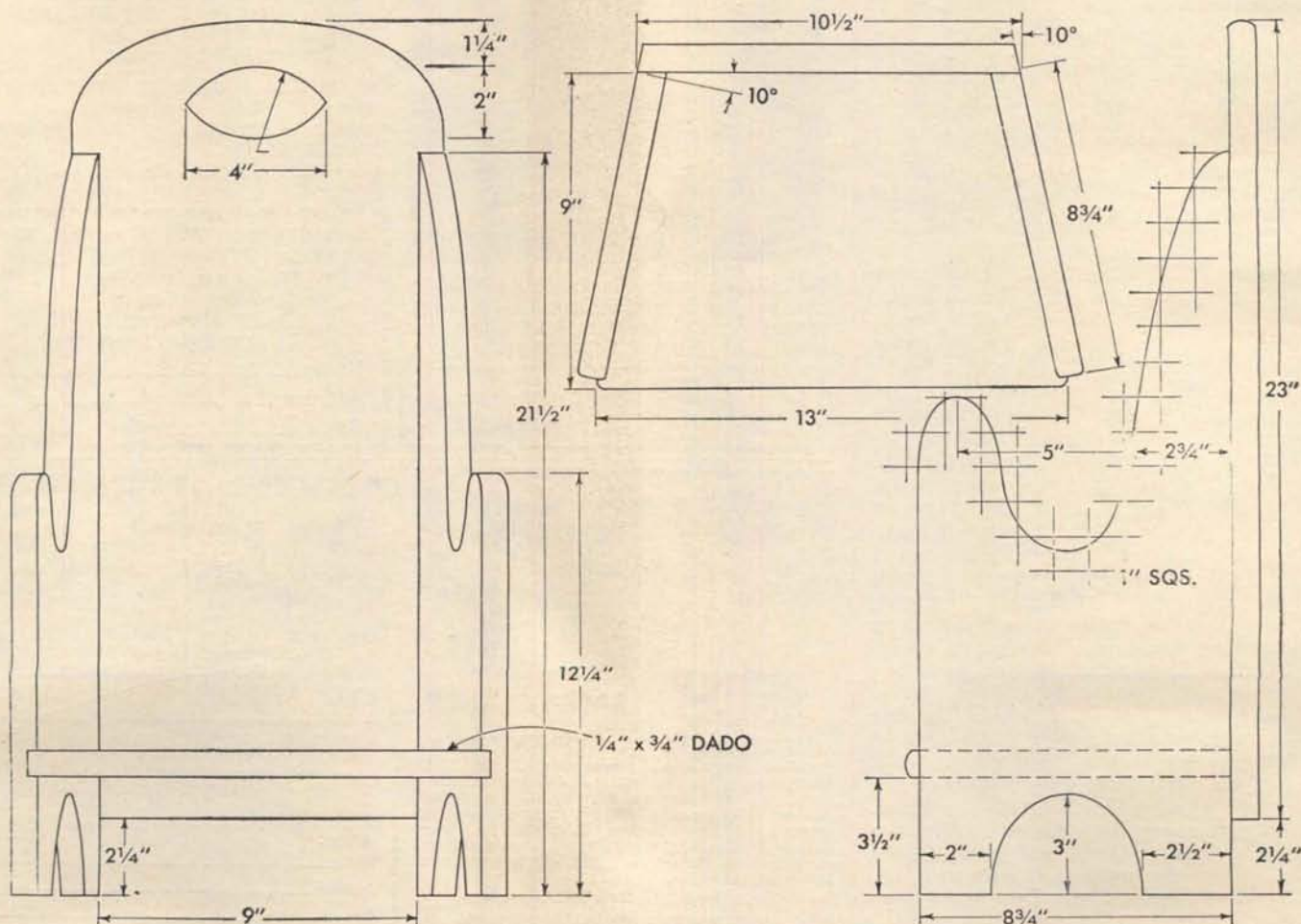


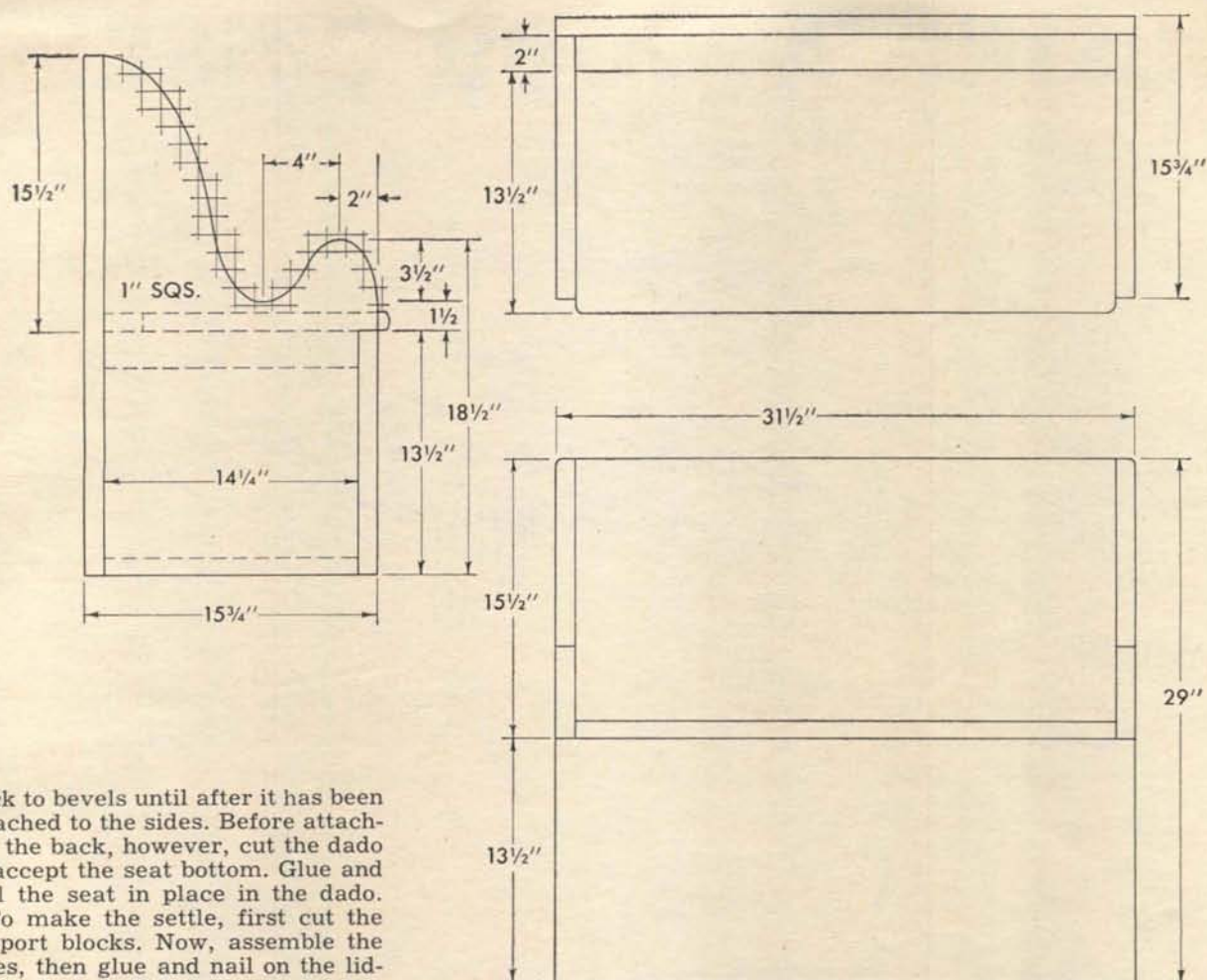
Early-American CHILD'S Chair and Settle

PATRICK K. SNOOK

Colonial in design, but universal in their appeal to children, these two items of furniture would make fine Christmas gifts. The settle has an added feature; there is a generous storage space under the seat for holding toys and other youthful treasures.

Cut all the pieces for the chair and settle to the sizes given in the Materials List, then shape them according to the plans. Make sure you bevel the back edges of the chair sides at opposite angles to make a pair. If you are using hand tools to build the chair, you need not plane the edges of the chair





back to bevels until after it has been attached to the sides. Before attaching the back, however, cut the dado to accept the seat bottom. Glue and nail the seat in place in the dado.

To make the settle, first cut the support blocks. Now, assemble the sides, then glue and nail on the lid-sides, bottom, back and front. Cut and fit the back section of the lid, then fit the larger part of the lid to make sure it will swing freely between the sides. Attach the lid with lightweight butt hinges.

Smooth and round all edges to simulate wear; especially round the front edges of the seats and the upper edges of the "arm" portions of the sides. Apply a stain of an "Early-American" color, then cover with a dull-finish clear sealer, applying several coats as protection against the strenuous wear and tear that energetic youngsters will give both these pieces of furniture scaled to their size.

Materials List

(Clear No. 1 Ponderosa or Idaho white pine)

Chair

Seat, 9" x 13", 1 req'd.

Back, 10 1/2" x 23", 1 req'd.

Side, 8 3/4" x 21 1/2", 2 req'd.

Settle

Side, 14 1/4" x 29", 2 req'd.

Upper back, 15 1/2" x 31 1/2", 1 req'd.

Front and lower back, 13 1/2" x 31 1/2", 2 req'd.

Back lid section, 2" x 30", 1 req'd.

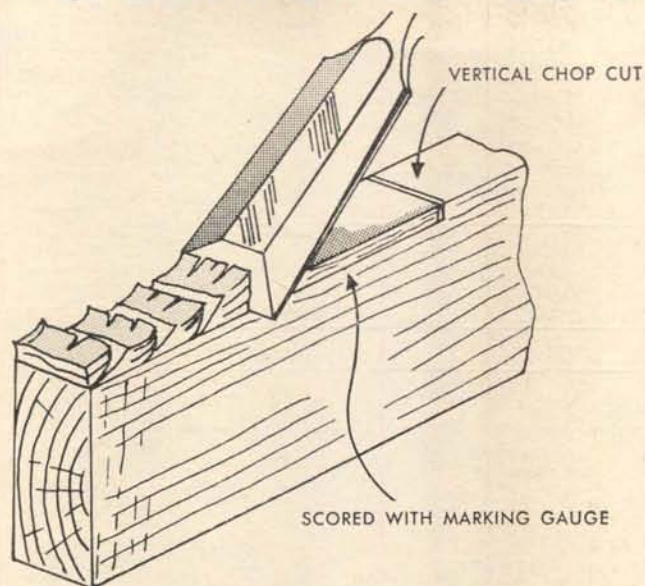
Lid (seat), 13 1/2" x 30", 1 req'd.

Seat supports, 2" x 14 1/4", 2 req'd.

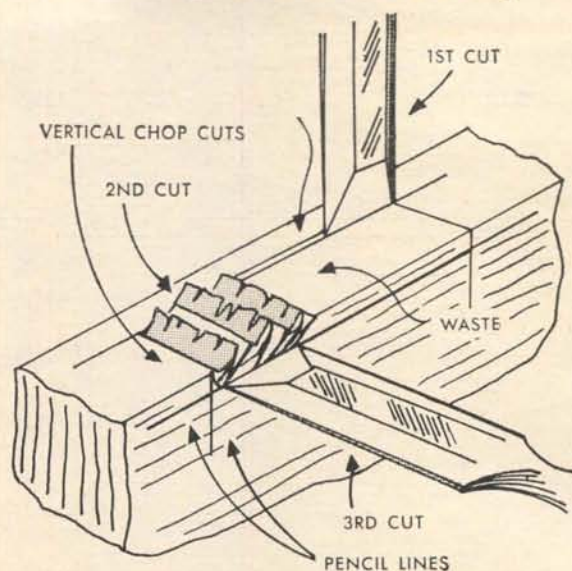
Bottom, 14 1/4" x 30", 1 req'd. △ △



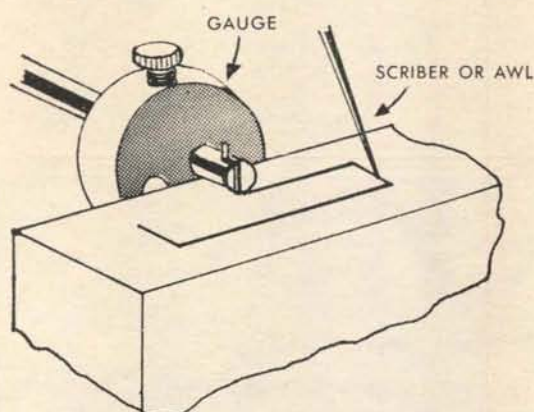
USING A WOOD CHISEL



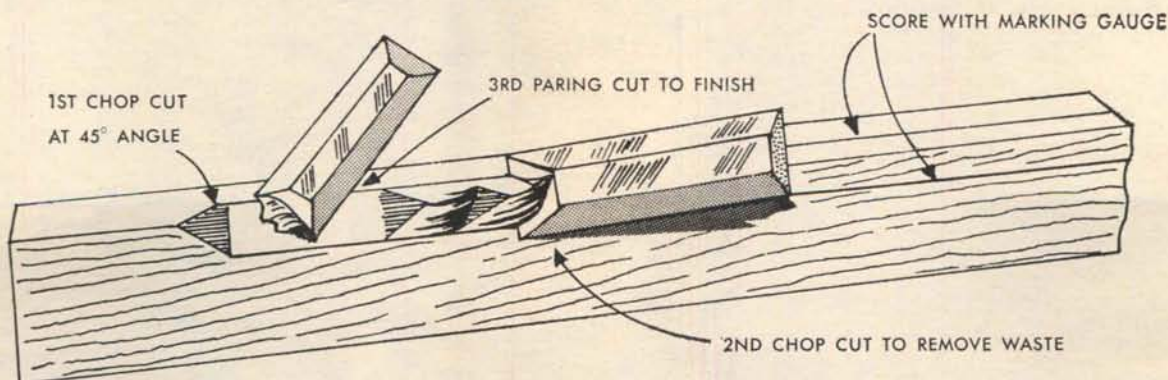
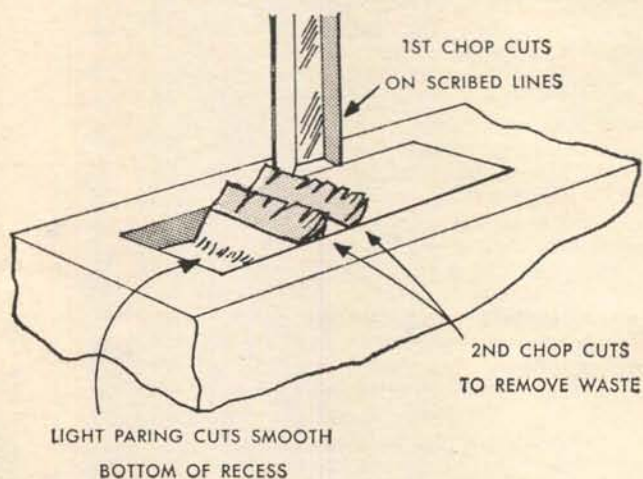
**SPACED SLANTING CHOPS
REMOVES STOCK TO DEPTH
WITHOUT SPLINTERING**



**CHOP AND PARING CUTS USED
WHEN MORTISING IN FROM EDGE,
AS FOR DOOR HINGE**



**TO FORM SHALLOW RECESS
SCORE OUTLINE WITH MARKING
GAUGE AND SCRIBER**



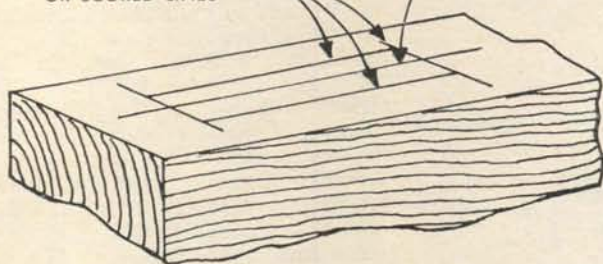
**MAKING STOPPED CHAMFER
WITH CHOP AND PARING CUTS**

NOTE: CHISEL EDGE MUST BE RAZOR SHARP

(MAKING COMMON CHOP AND PARING CUTS)

PENCIL LINES
OR SCORED LINES

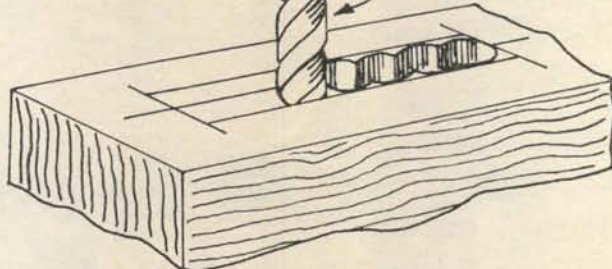
CENTER LINE



LAY OUT A MORTISE WITH PENCIL
OR SCORE LINES AND CENTER LINE



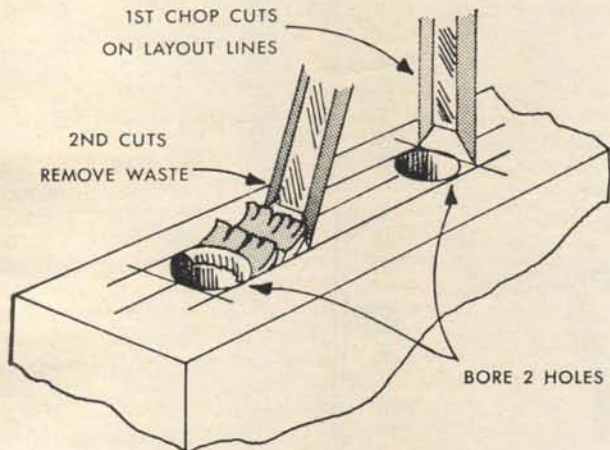
POWER BIT
IN DRILL PRESS



THEN DRILL OVERLAPPING HOLES ON
CENTER LINE, WITH BIT OF SAME
DIAMETER AS WIDTH OF MORTISE,
REMOVE WASTE WITH CHOP CUTS

1ST CHOP CUTS
ON LAYOUT LINES

2ND CUTS
REMOVE WASTE

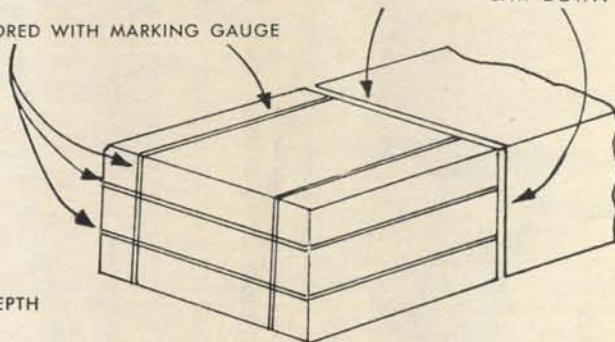


BORE 2 HOLES TO FULL DEPTH

IF DRILL PRESS NOT AVAILABLE,
BORE TWO HOLES BY HAND,
REMOVE WASTE WITH CHOP CUTS

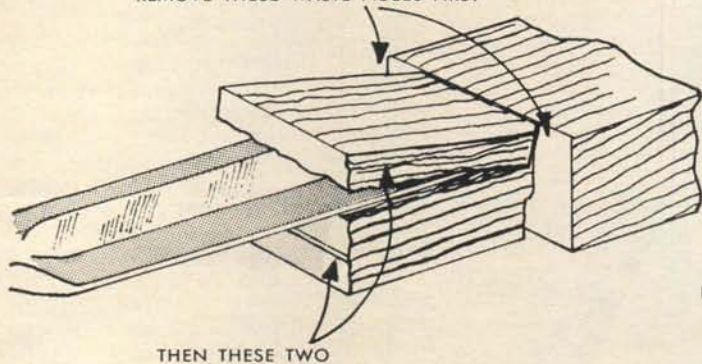
SCORED WITH MARKING GAUGE

SAW DOWN



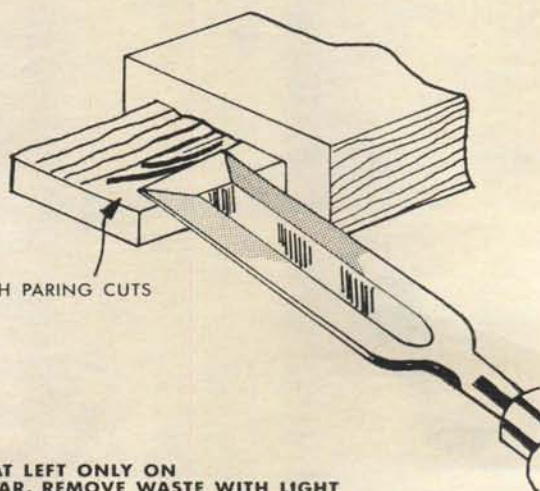
TO MAKE MATCHING TENON
LAYOUT, SCORE AND SAW
DOWN SHOULDERS FIRST.
LAYOUT SLIGHTLY OVERSIZE

REMOVE THESE WASTE PIECES FIRST



THEN THESE TWO

FINISH WITH PARING CUTS



NOTE: WASTE CAN BE REMOVED AS SHOWN AT LEFT ONLY ON
STRAIGHT-GRAINED STOCK. IF GRAIN IRREGULAR, REMOVE WASTE WITH LIGHT
PARING CUTS OR LIGHT, SLANTING CHOP CUTS

AMERICAN WINDSOR CHAIR

LESTER MARGON



We selected this chair from the American Furniture section of the Decorative Arts Department of the Chicago Art Institute, located in Chicago, Illinois. The Acting Head of the department was most cooperative, and gave us complete freedom of choice to select, measure and draw any item in the collection.

The Art Institute has many and varied collections, the American Furniture section being but one. We recommend that any lover of furniture make a point of visiting the extensive selections should they be in the Chicago area.

The American Fan-Back Windsor Chair shown is from Pennsylvania, and is dated 1680-1700. It is a bequest from Elizabeth R. Vaughan. The chair is made of tulip and hickory, the seat probably is pine. Quite exceptional is this chair as it includes so many of the characteristics to be found in the very best designs of the American Windsor chairs from New England.

The fan back of this chair has a shaped top rail that is deeply concave. It is just $\frac{1}{2}$ in. thick at the ends, being slightly thicker at the lower edge where the spindles enter it. The rail tapers to almost a knife edge at the top. The ends of the rail extend beyond the spindles and are called "ears". The volute-like carved designs on the ears give the needed grace and balance to eliminate a stiff look to the chair back.

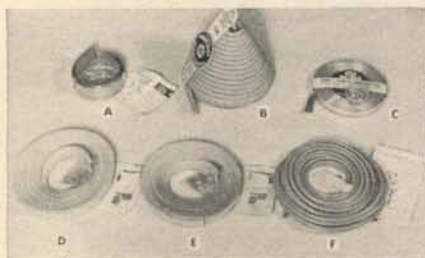
Spindles for the back, and the arm supports are turned and tapered, the longer end supports of the back are heavier turnings. Spindles between the arms and the seat are heavier also, being a "tulip"-type turning. The elaborately turned legs are decidedly raked with the tops entering the seat about 4 in. from the perimeter. The rake gives the chair grace, and provides a firm base.

A single block of wood some 2 in. thick is shaped and gouged for the "saddle" seat. The underside of the seat is shaped and chamfered to add further character and grace. The "character" of the turnings in the chair is shown in the upper part of the drawing, the "A" section being used in several places. Legs, for example, use the character with straight sections to give length.

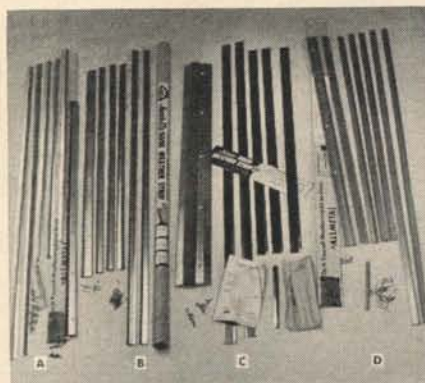
While Windsor chairs are supposed to have originated in England near a town called Windsor, it was in the United States that this type chair reached the highest development and refinement. English Windsor chairs are for the most part heavy and ungainly with heavy center splats and poorly shaped turnings. The American models are more delicately fashioned and with graceful turnings. Δ Δ

Weatherstripping

PAUL COREY

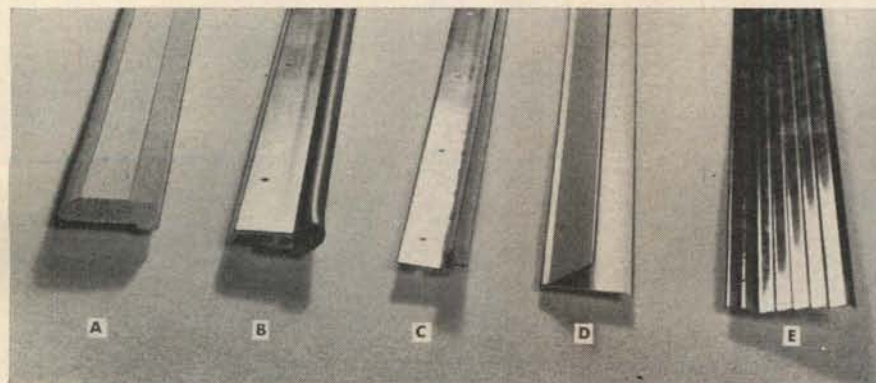


1. A, spring-strip metal. B, neoprene-covered spring metal and sponge rubber. C, metal and vinyl. D and E, vinyl curved for pressure and seal. F, vinyl.



2. Door seals. A, V-shape metal for top and sides, metal and felt for bottom. B, vinyl and metal. C, spring metal for sides and top, metal and vinyl threshold. D, V-seal with interlocking metal.

3. Cross-sections of: A, wood and vinyl foam. B, metal and vinyl. C, metal and pile fabric. D, V-metal strip. E, corrugated, spring-metal strip.

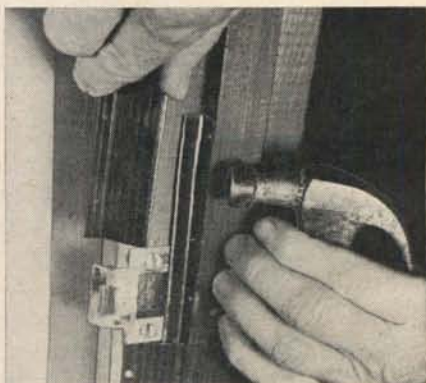


There is little argument about the need for weatherstripping to seal your home against cold and heat, but there is some confusion as to what materials to use. The old standby products are still available—strips of wool, cotton or hair felt; a water-repellent sheath of fabric around a cotton cord; and spring-metal strips of copper or stainless steel—but modern products are more efficient, more easily installed and longer lasting. Cost still is an advantage of the older products, you can seal a door or window with felt for about 25 cents. However, if

the door or window is opened and closed frequently, the material will practically disintegrate within a season.

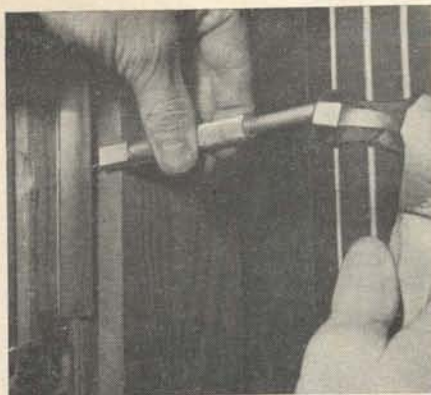
Most weatherstripping now is available in kits. Each kit contains enough stripping for a door or window, along with necessary tacks or nails to attach it. Some felt stripping is available with an adhesive backing. Felt stripping with metal support for improved appearance and longer wear is a good low-cost seal. Spring metal was one of the first materials offered in a kit. Now both vinyl and neoprene have joined

4. Spring-metal strips are fastened to door frame; special strip for latch.

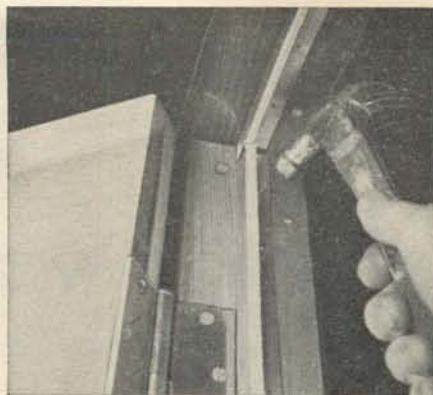


this trend. Kits for sealing wooden double-hung and casement sash and wooden doors, Fig. 1, are compact packages. All except the spring-metal type weatherstripping are surface-mounted on the door jamb or window frame.

There is a wider selection of door-sealing kits than window units. You can pay as much as \$10 for a kit, but the usual range is from \$3 to \$7, Fig. 2. In these kits the door sides are sealed with spring metal, a V-shape strip or a metal-vinyl combination. Bottom seals are felt and metal, vinyl and metal, interlocking-metal or metal-vinyl thresholds. In addition to those three, there are wood-vinyl foam and metal and pile-fabric combinations, A and C, Fig. 3. All five materials can be bought as top and side sealers only, bottom-sealing kits can be purchased separately. Metal seals of the spring type and the V-shape are fastened to the frame against the jamb. The seal is inconspicuous when the door is open, hidden when the door is closed. Both types have



5. Magnetized nail set is real finger saver when attaching V-metal strips.



6. Metal and fabric pile seal is surface mounted, butted at corners.

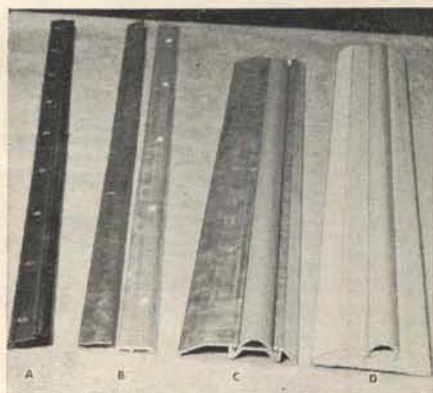
a special part to seal at the latch, Fig. 4.

A hammer and tin snips are needed to install metal weatherstripping, but a magnetized nail set, Fig. 5, is a real finger saver.

The metal and pile-fabric combination, Fig. 6, is surface-mounted, can be used on double-hung and casement sash.

Kits for sealing door bottoms range in price from 25 cents to \$4 and are of three types: Strips of metal with felt or vinyl that fasten to the door, interlocking strips of metal that fasten to both door and floor, and wood or metal thresholds with vinyl cushions that fit on the floor, Fig. 7. While the strip-to-door type is easiest to install, the threshold type is not difficult, Fig. 8. Other special types of door-bottom seals are designed to keep out rain. One is a set of interlocking metal strips. Another is a drip-cap that fits to the outside of the door at the bottom, B, Fig. 9. Another type lifts up to clear a rug when the door is opened, C and D, Fig. 9, and Fig. 10. A projection hits a plate on the jamb when the door closes, to force the seal down.

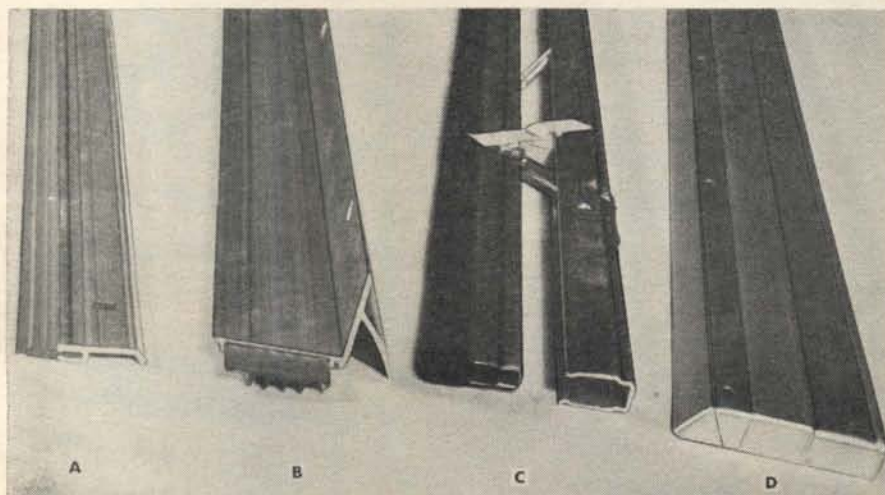
Weatherstripping for double-hung sash includes a strip for the center



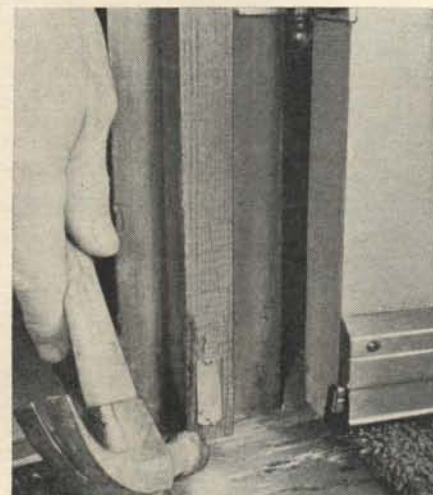
7. Bottom seals: A, metal and felt. B, interlocking metal. C, wood and metal thresholds with vinyl-roll inserts.



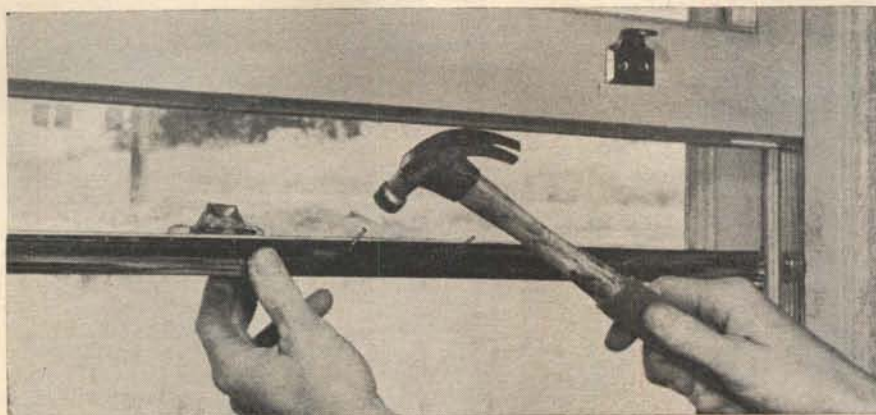
8. Remove vinyl strip, fasten threshold by nailing in channel beneath it, then replace vinyl strip in the channel.



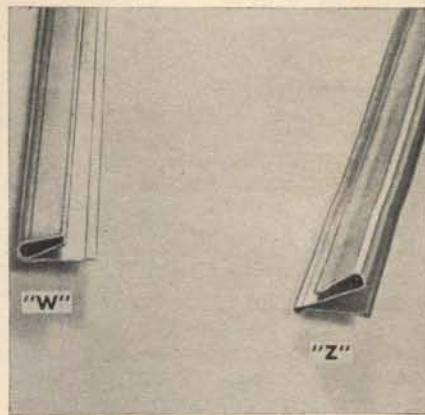
9. A, vinyl and metal seals for sides and top of door. B, drip-cap type seal for door bottom. C and D, parts of automatic-raising bottom seal.



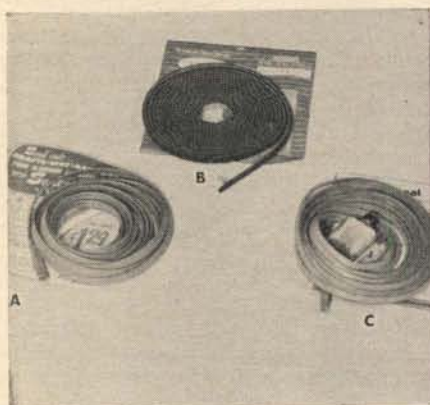
10. Projection on seal presses against plate on frame to force it down.



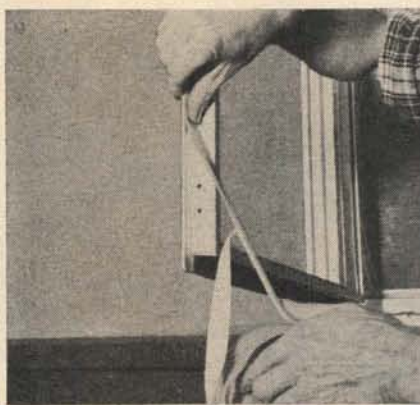
11. To install metal seals on double-hung sash, slip strips between sash and runways, then fasten strip to face of bottom rail of top sash as shown.



12. W-shape fits hinge and bottom side of casements, Z-shape is for top.



13. Kits for casements; A and C vinyl strips, B is urethane foam.



14. Peeling off back strip on urethane-foam exposes adhesive for applying.



15. Cord-type mastic is handy for sealing heat and cold leaks.

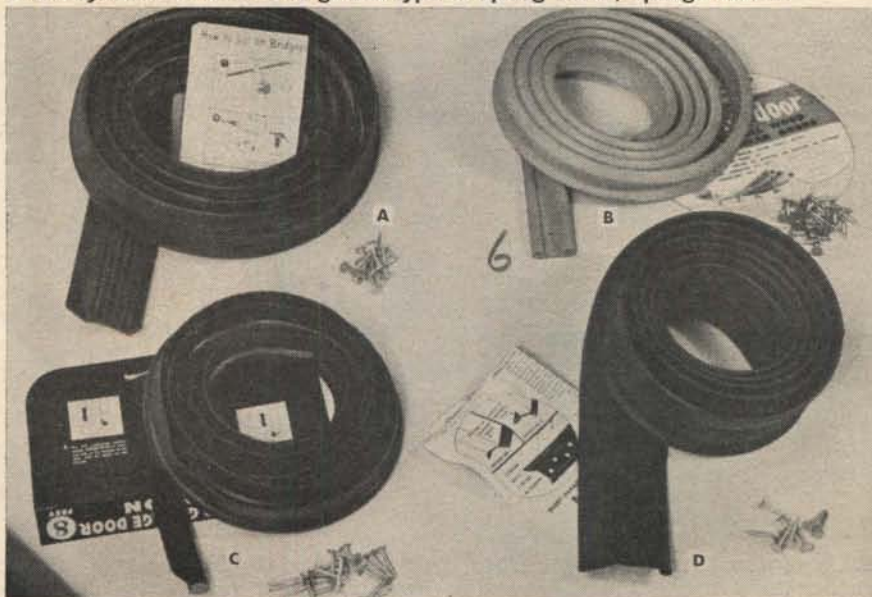
rail, Fig. 11, as well as metal strips for the sides.

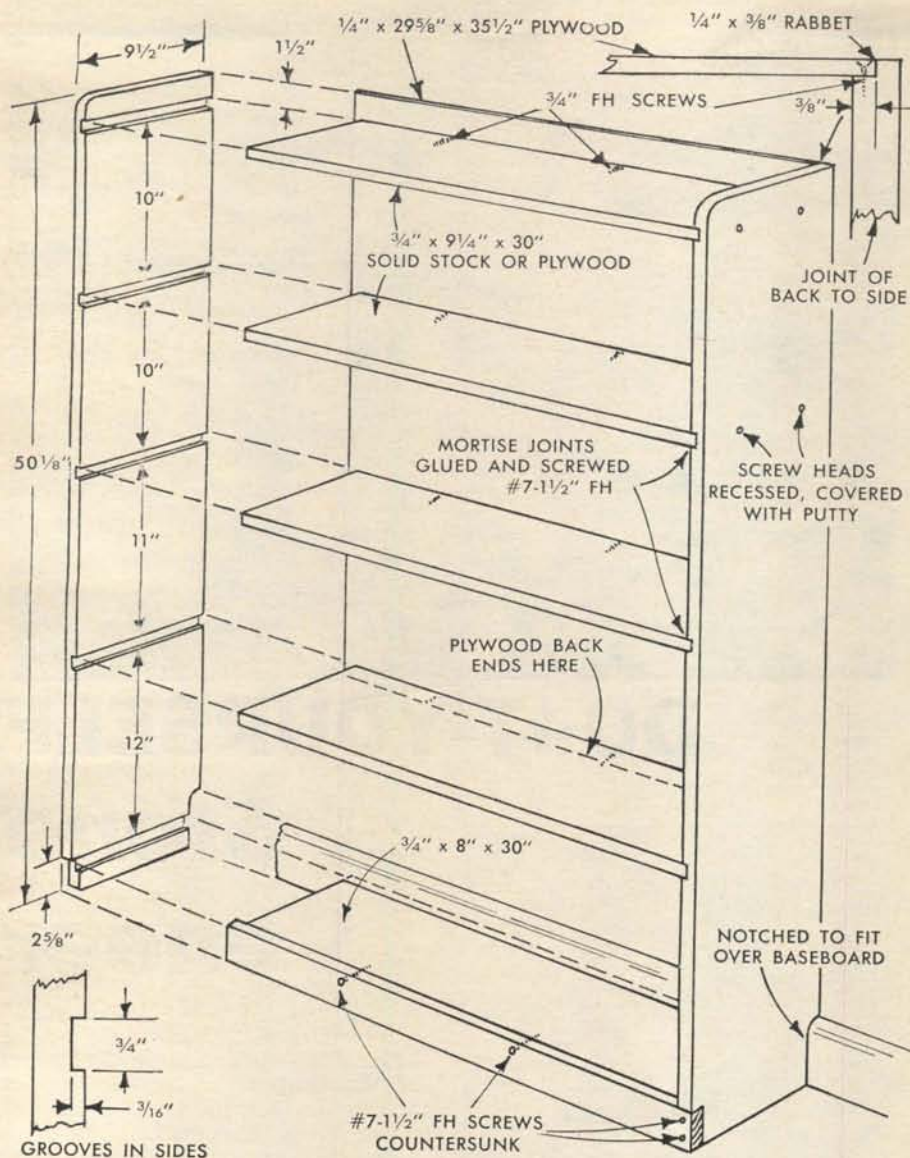
For casement windows, metal weatherstripping is easiest to install, Fig. 12. The W-shape fits the hinge side and bottom, the Z-shape fits the top and lock side of the frame. Vinyl and foam-type seals clip over the edge of the window frame or the sash, Fig. 13. Stripping off a protective strip, Fig. 14, exposes the adhesive of another type.

For emergency sealing of heat and cold leaks, keep a coil of mastic, Fig. 15, handy. It can be used as calking and stained or painted.

Both rubber and vinyl are used for the seals on the bottoms of lift-up garage doors, Fig. 16. The cushion-type of rubber or vinyl seals are fastened to the bottom edge of the door, lead photo. Sides and top of a garage-door opening can be sealed with any of the surface-mounted stripping. △ △

16. Kits for sealing bottom of garage doors: A and D are rubber-cushion types. B is vinyl-cushion seal. C is gasket type of spring metal, sponge rubber.





Lower back corners of bookcase sides are cut to fit over baseboard so case will fit snugly against wall as here.

STURDY BOOKCASE

Rigidity of this bookcase is obtained by mortising the shelves into the sides, and attaching a back of $\frac{1}{4}$ -in. hardboard or plywood to both. The back and sides project above the top shelf. This prevents soiling the wall behind the case when dusting.

A tight fit of the case against the wall is assured by cutting away the lower rear corners of the sides. When this is done the lower shelf must be narrower than the others, and the back does not extend below the second shelf from the bottom.

Start work on the sides, rounding the upper front corners at a radius of 1 to $1\frac{1}{2}$ in., then rabbet the rear edges of the sides for the back. When sawing the shelf grooves with a hand saw you can control the depth of cut by clamping a strip of

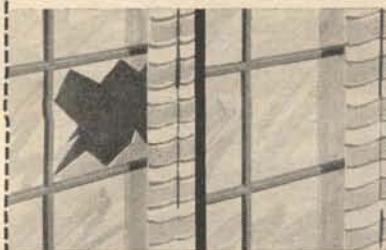
wood to the blade the desired distance above the teeth. For right-angle accuracy, clamp a guide strip to the work. Drill and countersink the screw holes to fasten the shelves in place, and make the cutouts that fit over the baseboard.

After cutting the shelves to length and width, apply glue in the grooves and drive the shelves in place; they should fit snugly. Drive the screws below the wood surface so that the heads can be concealed with wood putty. Similarly assemble the shelves to the other side. You can use a rubber mallet on the side to get the shelves seated in the grooves, after which you drive in the screws. Attach the back and screw it in place securely before the glue between shelves and sides

sets. If the back has been cut square, as it should be, this will further assure getting the shelves and sides at right angles to each other. Adding the lower front crosspiece completes the case except for the finishing. Note that the crosspiece extends to the outer surface of the sides after notches have been cut to accommodate it. This arrangement permits the crosspiece to be screwed to the lower edges of the sides to help make the case more rigid.

This case is intended for a painted finish, as the putty used to cover screw heads is best concealed with paint. Also, it is preferable to conceal end grain of the lower front crosspiece with paint, as well as the exposed portion of the back. $\triangle \triangle$

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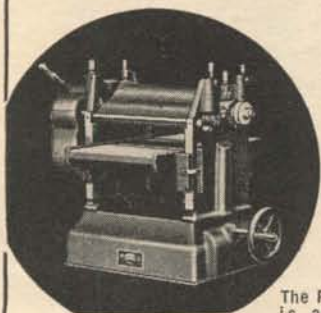
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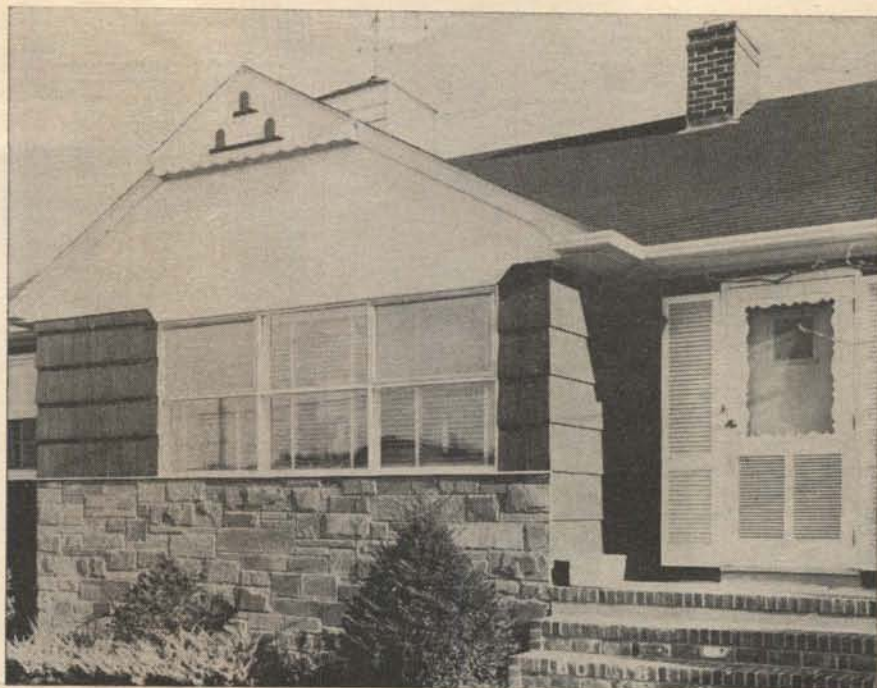
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The stone is furnished in random lengths from 8 to 24 in., and in modular heights of 4 and 8 in. Because it is natural stone, once it is in place there is no further maintenance, and the stone will not fade, peel or crack as do some imitation-stone products.

A level, hammer and screw driver are the only necessary tools. Each line of clips must be level to keep the courses of stone level. A screw driver is needed if one of two types of screws is used to attach the metal clips. Screws do provide a better fastening than standard nails, and there is less chance of breaking a piece of stone with a hammer if they are used.

As shown in the photos, each stone requires one or more clips—depending on the length. Once the stones are attached with clips, mortar is applied. Any standard mortar can be used, and it can be any color. An ordinary caulking gun is used to force the mortar into the joints. The mortar seals the joints and covers clips and screws. Once the mortar is in place, there is no way to determine the actual thickness of the stone. This adds a truly luxurious custom look to



Pieces of stone are applied to wall surface by use of metal clips that fit in slots cut in edges of top and bottom. Can also be applied to masonry.

any home exterior. The stone also converts an ordinary room divider into something unusual and striking.

After the mortar has been forced into the joints it is allowed to set for a few moments, then a jointing tool, or the tapered end of an old broom handle, is used to strike off the mortar. Any excess mortar that is on the face of the stone is brushed off with a soft-bristled

brush. This should be done before the mortar sets, as it then becomes difficult to remove. With a brush it is no job at all when it is still wet.

"Allegheny" stone is available at many building-supply dealers in the United States. For the name of your nearest dealer, write to: Allegheny Natural Stone Co. 1237 Belmont Ave., Paterson 2, New Jersey. $\Delta \Delta$



Standard calking gun is used to apply mortar of any color that hides joints, metal clips and nails or screws.



Joints are struck off with length of rounded broom handle or jointing tool. Excess mortar then is brushed off.

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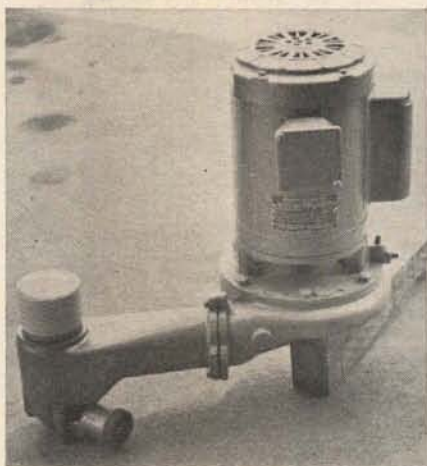
Installing A Whirlpool Bath

The benefits of a Whirlpool bath now can be built into any home bathtub, and any home owner familiar with plumbing can do the job. Depending on the situation, the J-500 for installation at the tub end can be used, or the J-600 for an under-the-tub will be required.

We photographed the J-500 installation, where it was necessary to chop a hole in the wall of an adjacent closet. There should have been an access door for the plumbing, but this seems to be one of the cost-savers that home builders utilize. After the installation, (not shown), we framed the opening and fitted a plywood door.

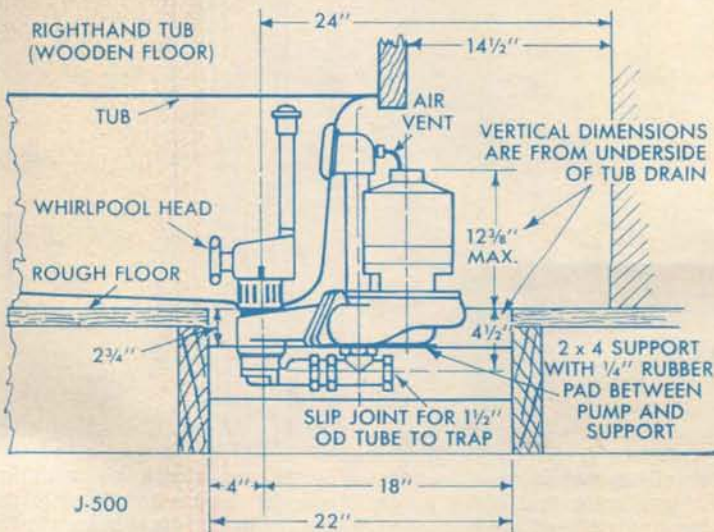
Although the instructions state that 2 x 4s are adequate as support,

Model J-500 has motor projecting upward, fits at end of tub, as in lead photo and our installation.



we fabricated a bracket of flat steel to fit this particular situation. Our biggest problem was photographing the installation; as can be seen this is a very restricted location. We show the underside of the floor where the J-600 was installed, but it was simply impossible to show a true picture of the completed in-

With no built-in opening, it was necessary to chop hole in wall, cut floor to make installation in closet.

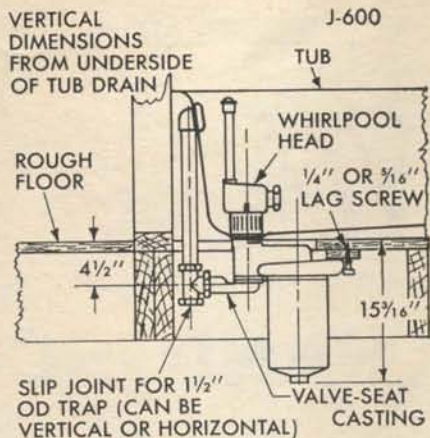




Installation at end of tub took some hard work, tight quarters made precise pipe fitting especially important.

stallation, as all that could be seen was the underside of the unit. By installing both units we did learn that it is not difficult; any handy home owner can do the job. A hot, relaxing Whirlpool bath soothed tired muscles, and made this one job that definitely has immediately tangible results.

For full information write: Jacuzzi Research, Inc., 1440 San Pablo Ave., Berkeley 2, Calif. Δ Δ



Model J-600 has motor projecting down, for installation under tub, and under floor. This was not photographed.



This is location for installation of under-the-floor unit. Our photos showed only underside of pump, are not included.



Any tub, as shown here before installation, can be fitted with Whirlpool Bath by home owner who is handy.



41. Model train table



26. Radiator cover and matching bookcase



28. Sip 'n snack center



31. Family leisure center



63. Winter toboggan



45. Sew door

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WORKBENCH

Women's Page

SAND SCULPTURES

HI SIBLEY

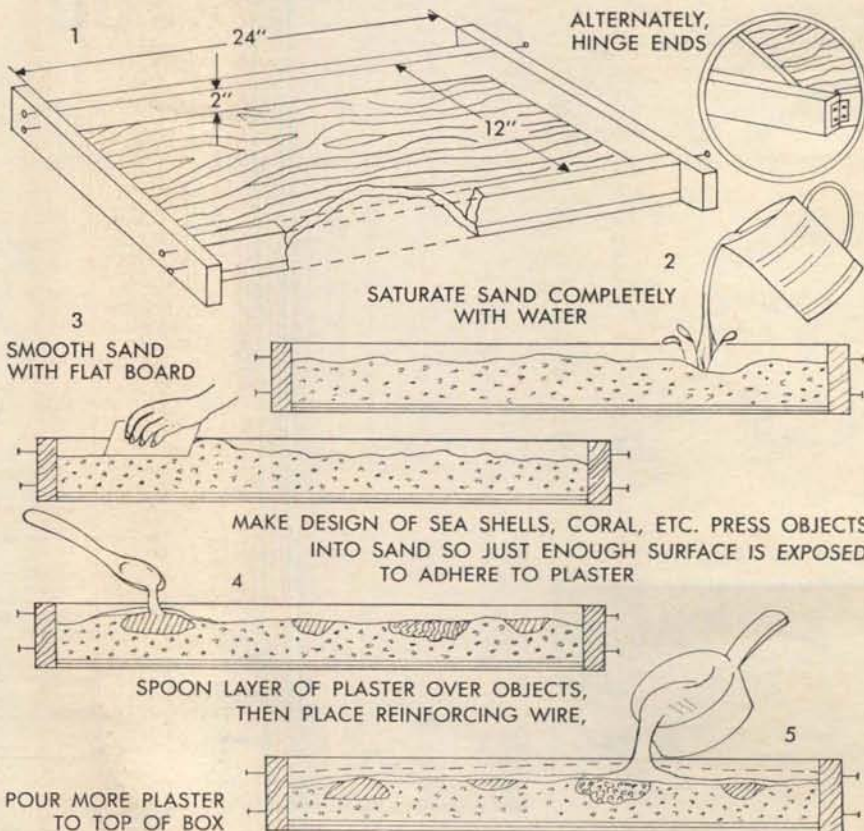


Some very attractive sand sculptures, (really castings), have been made by Mrs. Marie Weisbrod of Riverside, California for her art classes at Redlands University.

These consist of plaster of Paris

plaques embedded with shells, coral, colored stones, starfish and other interesting objects, the assembly being cast in a sand mold.

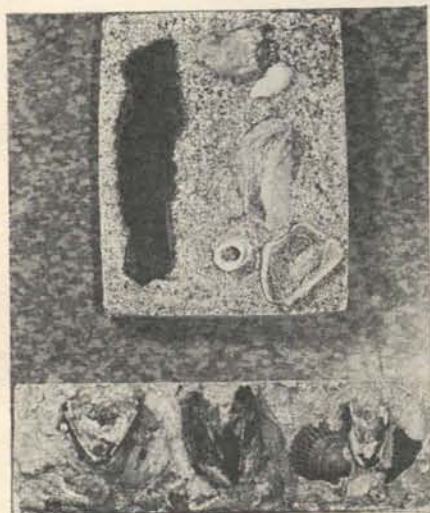
The first step is to make a box with removable ends, Fig 1. After



oiling the inside of the box, fill it with sand to about 1/2 in. from the top. For small plaques, sand can be purchased at pet shops; for larger quantities see a building-supply dealer. Next, pour in water to saturate the sand thoroughly, but just enough to make it firm, Fig. 2. Smooth the sand by hand or with a flat board, Fig. 3. If you wish, form some sort of design in the sand to relieve the monotony of the flat surface. Now, press in shells, rocks and other items leaving just enough of their surfaces projecting to adhere to the plaster, Fig. 4. About 5 lbs. of dry plaster



Driftwood, snails and sea shells are combined in this plaque. The dark, mottled appearance is sand.



The casting at the top utilizes ordinary meat bones to produce an unusual, "surrealistic" design.

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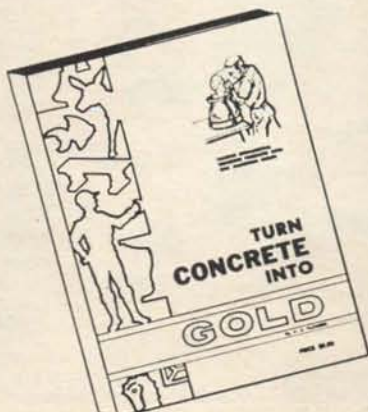
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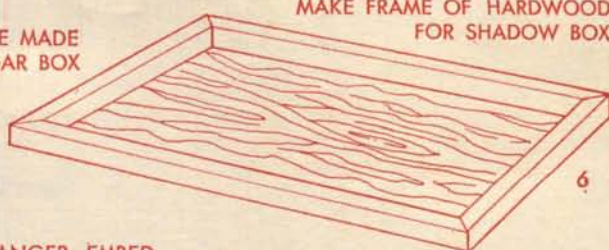
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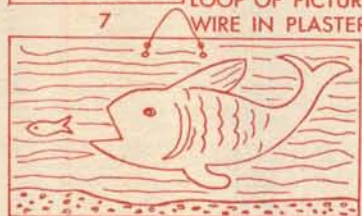
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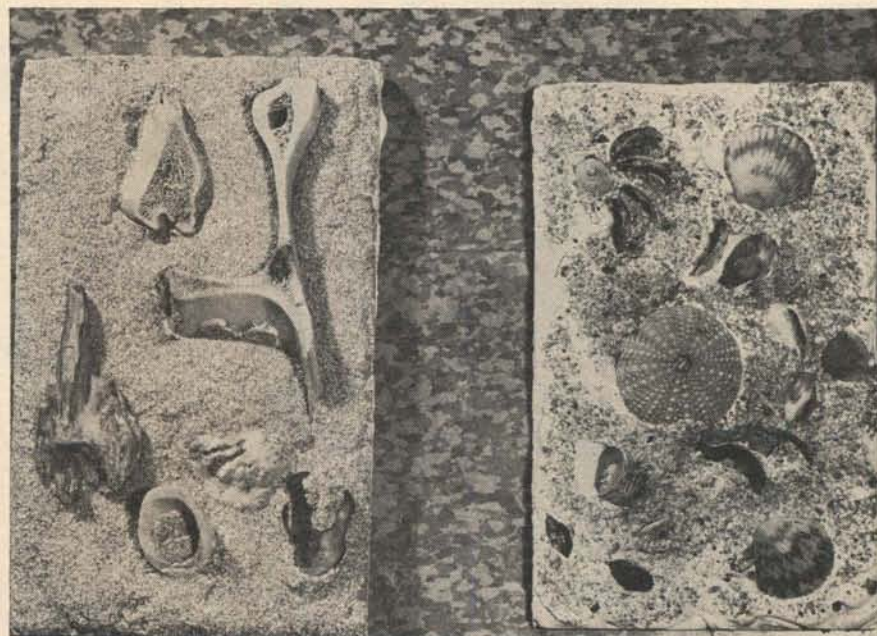
HOOK FOR HANGING

will be required for this mold, using one third more plaster than water. Stir until the plaster has the consistency of heavy cream. Dribble a small amount of the plaster over the shells and sand to make a first layer, then place a rectangle of poultry wire over it for reinforcement, Fig. 5. Pour on the rest of the plaster to fill the box. Allow the plaster to dry for one hour, then turn the form over and allow it to dry another half hour. Use a soft brush to remove excess sand from the plaster, which will still be soft. Allow the plaster to dry for 24 hrs. before handling it too much.

A frame made as in Fig. 6 lends a "shadow-box" effect to a plaque. It should have a backing of $\frac{1}{4}$ or $\frac{3}{8}$ -in. plywood, which does not quite extend to the edges of the frame. Corners of the frame are mitered

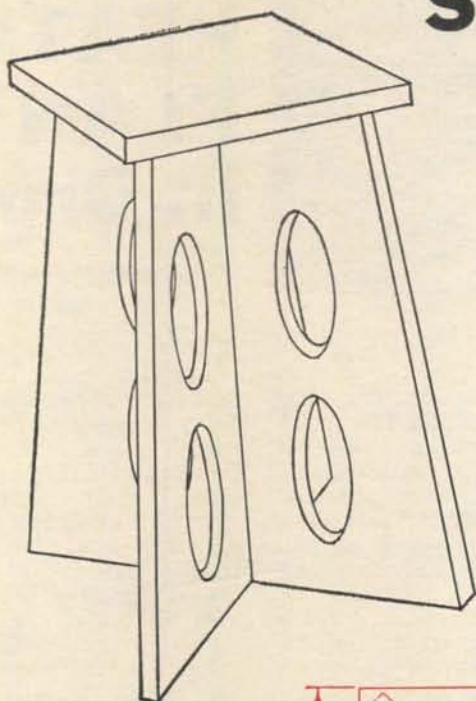
and secured with waterproof glue and corrugated fasteners on the underside.

Novel smaller plaques can be made in cigar boxes. Such a plaque design is shown in Fig. 7. This type plaque can be formed in deep relief, using such items as cake and gelatin molds, or shaping freehand. A loop of knotted picture wire embedded in the fresh plaster provides a method of hanging. Four pounds of fine or coarse sand fills an average cigar box, and the sand can be used again and again. Cost of the sand will be about 8 cents. Cost of the 5 lbs. of plaster of Paris will be about 35 cents. The plaster is sufficient to make four small plaques. There are an infinite variety of designs to work out, and practice on simple figures will soon have you producing more ambitious designs. $\Delta \Delta$



Size and shape of a sand casting are restricted only by the imagination of the creator, and by the physical limits of the working area.

KNOCK-DOWN STOOL

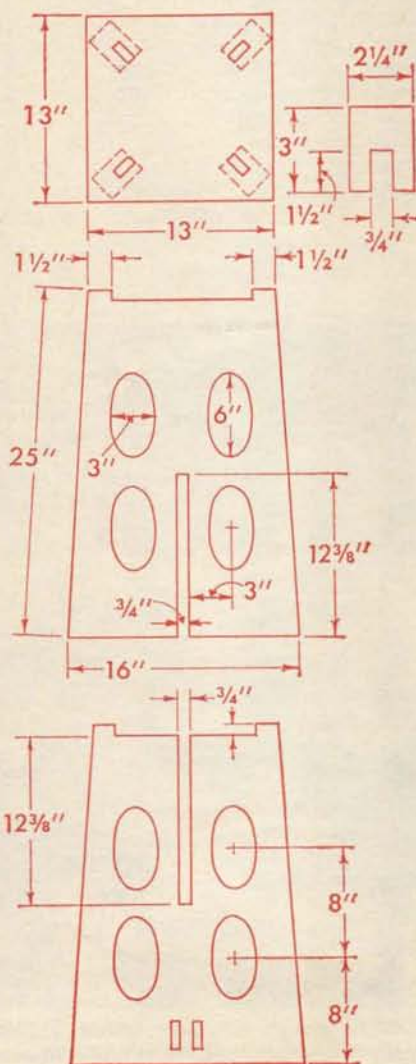


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Use $\frac{3}{4}$ -in. plywood for the two legs and top of each stool. Note that the notches in both legs are identical, but that one is cut at the top, the other at the bottom. Check each pair of legs for fit. It may be necessary to file one or both slots to permit an easy sliding fit. At the same time, be sure the slots fit snugly enough so the legs do not move at the joint. For further assurance of the rigidity of the stool, center the pair of legs on the top, then mark the location of each leg projection. At each location nail and glue a C-shape block of plywood as indicated.

If the stools are to be used indoors, fit a furniture glide near the end of each lower edge. If used outdoors, fit a short length of do-it-yourself aluminum bar or channel near the end of each leg. $\Delta \Delta$



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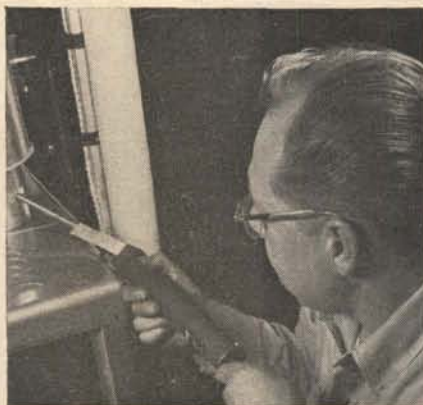
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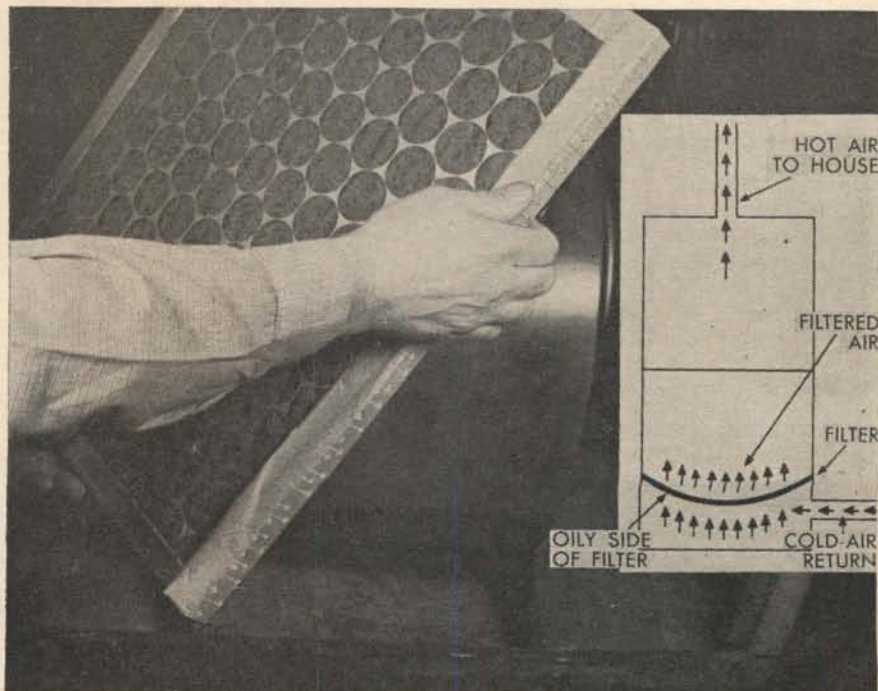
MORTON J. SCHULTZ

Until my heating plant quit one day last winter, when the temperature was near zero and there was about five feet of snow on the ground, I had pretty much taken it for granted that a furnace would run for years with no attention. When I called a serviceman he told me he couldn't help me until evening, (it was 10:30 in the morning).

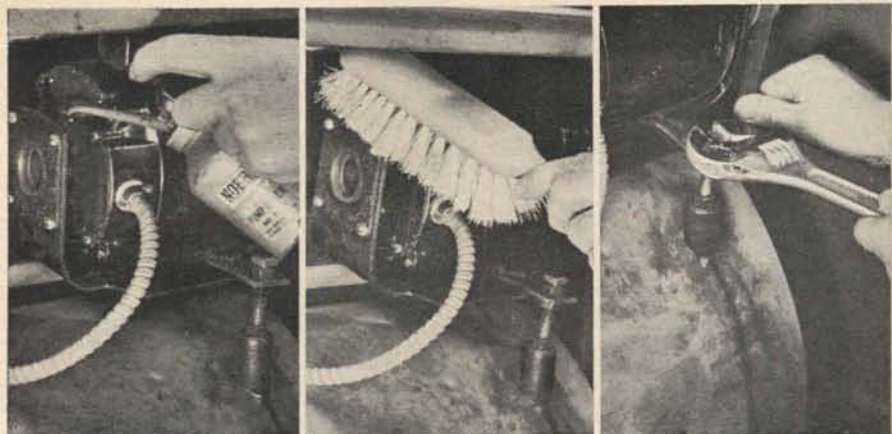
It was a miserable day for the family and me, and it was no consolation when I started doing research to learn that about 2 1/2 million homes have the same problem every winter. That figure, by the way, was obtained from the Oil Burner Council and from utility companies that serve gas-fired furnaces. I did learn that most furnace break-downs can be avoided by preventive maintenance or service.

The first point to remember is that a furnace is a precision machine that must be adjusted correctly, not only to guard against break-downs, but to assure maximum heating efficiency. With the exception of a few jobs, the average homeowner should let only a trained specialist equipped with the proper tools touch his furnace. This is more true with oil-fired than with gas-fired systems. With the latter there are more things you can do yourself to assure good heating. But, if you have a real problem, a competent serviceman is your only answer.

Then why bother to read this article? "I'll just call a furnace serviceman and he'll know what to do." But will you know what he should do? That is the problem; there are honest, competent servicemen, and



1. Note arrows on filter frame, indicating direction of air flow. Filter is very important; a clogged filter cuts heating efficiency drastically.



2. Left, lubricate motors as per instructions on plate, do not overdo.
3. Center, frequent brushing of motor and blower keeps them in shape.
4. Right, periodically check tension of belt from motor to fan; adjust.

there are others who are not. This article will describe the services that are necessary to assure maximum and constant heating from your furnace, whether it is oil or gas-fired. We will tell you how to get the best service for your money. If a so-called expert tries to talk you into anything else, or if you see him doing something not described in this article, you had better ask him for an explanation. If the explanation does not sound plausible, tell the man you'll think it over. Then call another serviceman to check on the first. Or, better still, check with your friends and see who they use for furnace service. Quite likely a number of people will have used the same man, and found him competent and with fair charges for his services. **Gas-Fired Systems**

If you heat your home with a gas-fired system, the recommended time period between calls by a serviceman is once every three years. The jobs that need to be done once a year or less can be handled by the home owner.

According to the findings of gas companies, even the three-year period is proving unnecessary if an area is supplied with natural gas. Natural gas causes very little deposits from combustion. Most gas companies do maintain the automatic three-year service call to give a customer confidence in his heating plant and to promote good will.

This situation also means that you should not let an independent company sell you an annual-service program if you have a gas-fired furnace. Also, when you do have trouble, first call the utility company. Most utility companies do not charge for the service, although

there is a charge for necessary replacement parts.

Let's talk about those services that you as a home owner should perform on your gas-fired unit before the heating season starts. Wherever the service applies also to oil-fired units we will so state. The oil serviceman you should call annually, however, should take care of most of these tasks for you. If your home has a forced-air system—oil or gas—make sure the filter is clean. Very important, and too often overlooked, a dirty, clogged filter causes a furnace to work overtime to compensate for the blocked heat, resulting in high fuel bills and insufficient heating.

All heating-plant manufacturers recommend that a new filter be installed at the beginning of the heating season, and that it should be cleaned at least once every four weeks. A new filter should be installed at the midpoint of the heat-



5. Chemical cleaning of oil burners is common practice. Cleaner is fed to pump, is circulated through all parts.

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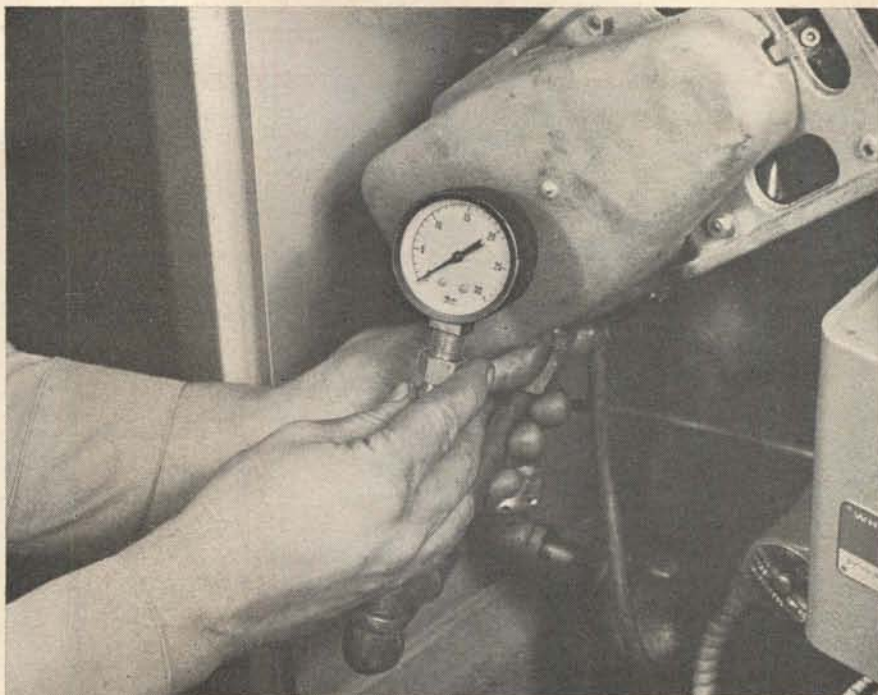
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6. Pressure gauge tells pressure pump is producing. Too much is as bad as too little. If pressure is incorrect according to instruction plate, change it.

ing season. To clean a filter, remove it from its housing and tap it several times on the floor or shake it out. Do not brush it or run a vacuum over it, this loosens the fibers, thinning them and reducing the filter efficiency.

Replace the filter the proper way; filters in cases or frames usually have arrows indicating the direction of air flow. If there are no arrows, position the oily side of the filter toward the cold-air returns. A tip-off to a clogged filter is rapid and continuous cycling of the burner. If it goes on and off every few minutes, check the filter; quite likely it will be filthy. The high-temperature thermostat in the bonnet of the furnace is turning the burner on and off, and the upstairs thermostat has little or no control.

If your house has a steam or hot-water system—oil or gas—make sure the water level is right. If there is no water, there will be no heat. Other periodic jobs are the lubrication of the blowers and motors of forced-air systems, and the pump motors for hot-water systems—both oil and gas-fired. Carefully read the instruction plate that is attached to every furnace with a blower or pump. If there are oil cups on the motor and blower, determine the amount of oil required. If the instructions say so many drops, use only that many drops. Too much oil can cause problems. While once a year is the usual lubrication period, in very cold climates two or three times

during the heating season is safe, Fig. 2.

If there are no oil cups, nor grease fittings, the bearings may be "oil-less" or "self-lubricating". Some types of these bearings, however, do require lubrication after 15 to 20 thousand hours of operation. Check the instruction plate for the time, then estimate how long the motor or blower has been running. If it is time, have a serviceman do the job, as the motor and/or blower must be disassembled for the operation.

Brush away any accumulation of dust and dirt around blower and motor, Fig. 3, to clean all air ports.



7. Here serviceman is taking CO₂ sample of exhaust gases for analyzing. This is not a job for the home owner.



8. Stack temperature of this furnace is ideal, about 290 deg. Stack temperatures can get near 800 deg., which means trouble in the furnace.

Restricting these ports could cause damaging heat build-up. Check the V-belt that drives the pulley in forced-air systems. If a belt is worn, split or cracked, replace it. It also is good insurance to have a spare belt on hand in case of breakage in the middle of winter. A rotating belt will stretch with wear and should be tightened as necessary. A deflection of about 1 in. is correct. An adjustment bolt on the motor support, Fig. 4, permits tightening the belt. Do not over-tighten a belt; this will cause wear on the bearings.

The following check-list, issued by several utility companies for use by their servicemen, is what the serviceman should do, (if you have to call an independent dealer, have him follow this list). This check-list also is the one followed during the three-year check-up for gas-fired plants.

Check-list For Gas-Fired Furnaces

1. Check for draft at draft-hood relief opening when heater is running. Check condition of chimney drop leg where there is clean-out. If there are indications of possible lack of positive draft, as might be in homes where other than gas was previously used, check condition of chimney base. Clean blockages at base, except when masonry repairs are required, in which case advise customer of need for repairs. (Such repairs must be done by mason or home owner, not by serviceman.)

2. Check pilot and burner, clean if necessary. Make necessary control and burner adjustments. If main

burner flame is effected by conditions of heater-flue passage, arrange for cleaning.

3. Check and reseal areas of combustion chamber and flue passages that might leak.

4. On conversion burners, make neutral-point, fire-door draft check and correct as necessary.

5. Check safety pilot for proper thermal functioning.

6. Make electric-continuity test of limit control.

7. Check thermostat points.

8. Test operation of low-water cut-off in a steam boiler.

9. Check conditions of forced-air filters and blower-fan blades.

10. Check to see if customer has complied with lubrication instructions for blowers and motors.

11. Adjust or align fan belts.

Maintenance of Oil Fired Units

Two major changes have been made in oil-burner maintenance in the last few years. One is the time of year maintenance is performed, the other the method of maintenance. It now is agreed that oil-burner maintenance should be handled once a year, but not necessarily just before the heating season begins. It can be done any month of the year, but never more than 12 months apart. This schedule offsets the usual rush period that hits a service company in fall, and permits the serviceman to give better and less hurried service.

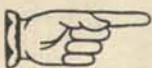
A new method of cleaning oil burners with chemicals has been developed in the last few years. This eliminates the mess involved in vacuuming the burner and ad-

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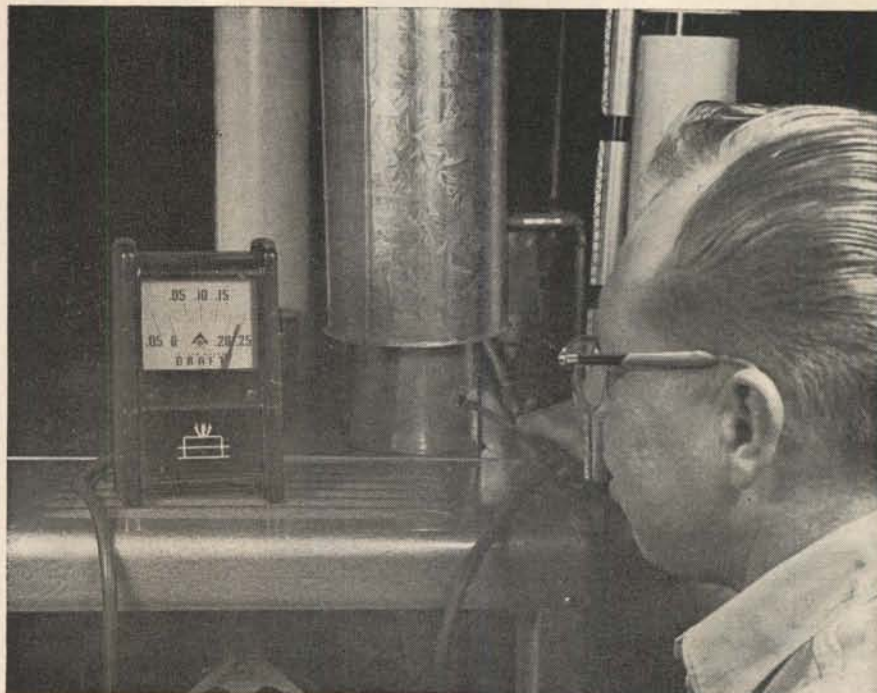
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9. Here serviceman is taking draft reading at the flue. Gauge seems to indicate too much draft. Compare this gauge with one your serviceman uses.

jacent parts, and according to reports, does a thorough job. More and more oil-burner service companies are adopting this method.

The chemical is fed into the burner pump, Fig. 5, and the burner is run. As the chemical circulates it picks up dirt, dust and lint and discharges it into the flame where it is burned. The burning chemical then contacts the flue and smoke pipe and cleans away carbon deposits.

Checking, adjusting and cleaning an oil burner requires a number of special instruments. While some servicemen refuse to use such instruments, from an engineering standpoint, no other way has been devised to accurately check the efficiency of an oil burner.

Proper firing rate is determined by fuel-pump pressure, nozzle size and firing rate of the ignition system. Pump pressure is checked with a gauge, Fig. 6. Nozzle size will be on the furnace data plate. The nozzle is cleaned chemically or mechanically, then the ignition system is adjusted. Correct air-oil mixture is determined by analyzing the flue exhaust for CO₂ content, Fig. 7. The more CO₂ the better, 8 per cent being minimum. Adjustment of air-oil ratio may be required. Stack temperature is checked, Fig. 8, and should not be more than 800 deg. F.; the lower the better. Proper draft is determined by the condition of the furnace and the chimney. A draft reading, Fig. 9, should indicate .030 in. over the flue breeching and .020

in. over the fire. A smoke test is taken to determine the amount of unburned fuel that is escaping. A pump withdraws an exhaust sample, lead photo, which contacts a piece of treated paper. The color to which the paper changes is compared to a graduated scale to determine necessary adjustments.

If chemicals are not used, the filter in the oil line should be removed and cleaned, Fig. 10.

To find a good oil-burner serviceman, check with your friends, or look in the yellow pages of a phone book for a factory-authorized company. You will get no bargains but you will get competent service at a fair price. $\Delta \Delta$



10. Filter in oil-supply line should be replaced every year. If it gets clogged, oil to burner is reduced.

Doorknob Handle For Tools

While most power tools built recently, such as drills and jig saws, have an extra knob to provide greater control, most older tools are not so equipped. I have a jig saw that has given me excellent service for many years, and I made provision for the control knob in the following manner:

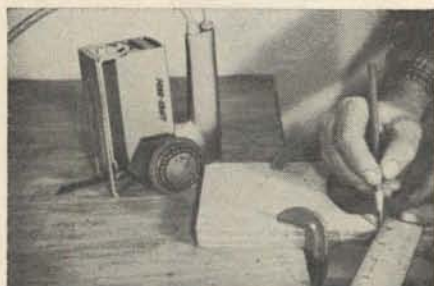
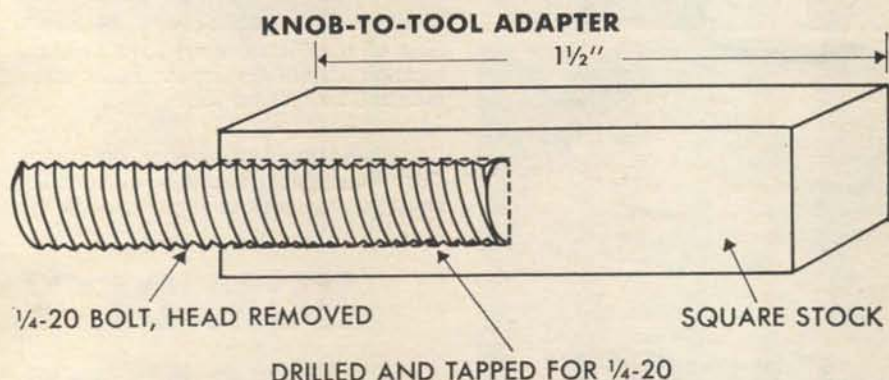
I first found an old door knob in my scrap box, as well as a length of the square shaft on which it was fitted. As shown in the drawing, I drilled and tapped a 1½-in. length of the square stock to receive a ¼-20 bolt. The bolt was turned in

the threaded hole, then the head was cut off, leaving about ½ in.

If there are no threaded holes in the power tool, they can be drilled and tapped. Locate the hole in a convenient spot in a thick portion of the casting. It may be advisable to disassemble the tool housing to avoid damaging the internal parts of the tool. Some tools will have a boss cast on the housing, which has not been drilled and tapped. This, of course, is where you should locate the tapped and drilled holes for the auxiliary handle. △ △

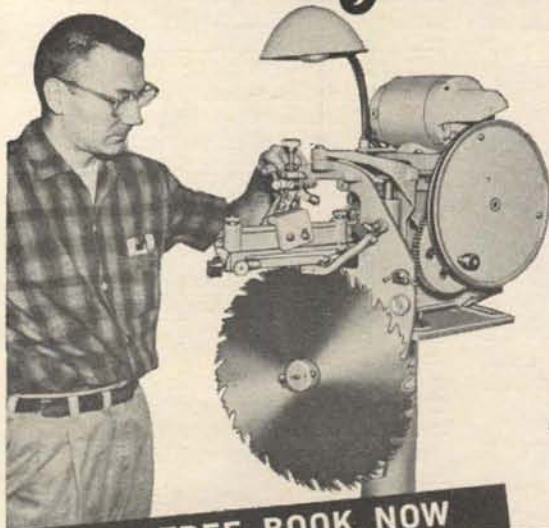


Knob is fitted to left side of jig saw here, where it helps considerably to control sawing an intricate pocket cut.



For another job, knob can be fitted to right side, depending on need for control in making cut with jig saw.

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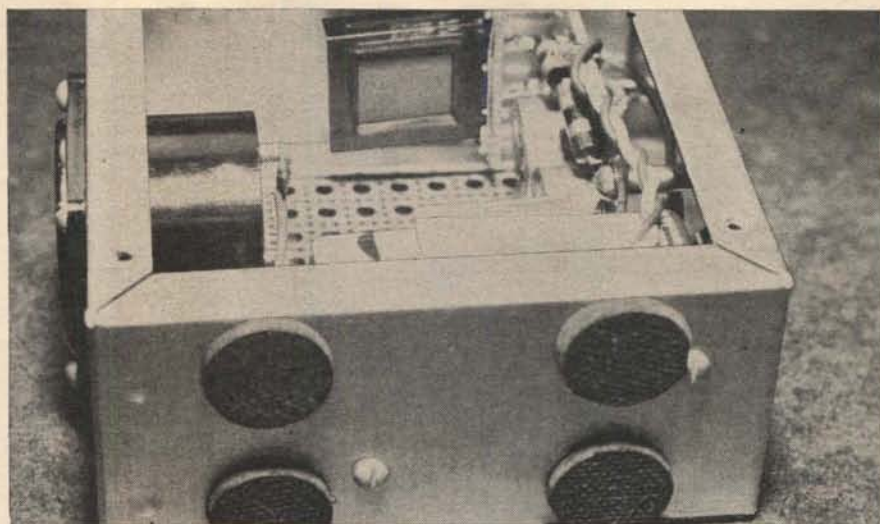
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Side of case is removed here to show location of humidity sensor, other parts; note rubber feet on case.



Completed humidity sensor, in operation. Unit is very sensitive to humidity changes, registers changes quickly.

HUMIDITY INDICATOR

JAMES G. LEE, W6VAT

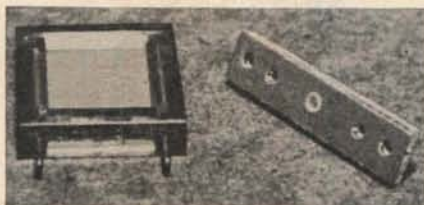
Heart of this unit is a sensing element that consists of a thin-film coating over a grid network. A by-product of transistor physics, the grid is effected directly by the moisture content of the air, and its resistance changes. When wired into a "balanced-bridge" network the changes in resistance can be read on a meter, as the changes are directly proportional to humidity changes.

As indicated in the schematic and pictorial wiring diagrams, the humidity indicator contains only the sensor element, four resistors, a dry cell and a meter. Resistor R1 in series with the battery limits the current flow through the meter. The indicator can be adjusted to read zero at zero per cent humidity and one at one hundred per cent humidity.

The indicator is built in a 2 x 4 x 4-in. metal box. Any wooden or metal box of comparable size also could be used. The box, as well as other electronic parts can be purchased from mail-order houses such as Allied Radio in Chicago, Lafayette Radio in New York, or Burstein-Applebee in Kansas City, Mo. One exception is the HA-26



One side of humidity sensor is solid, and information is printed on it. Sensor fits in socket made of Bakelite.



Open side of sensor must not be touched by fingers; even cigarette smoke will effect its sensitivity.

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Hygropak® humidity sensor and socket that are available only from Photo-Crystals, 605 Prairie St., St. Charles, Ill., at a cost of about \$3.

Free air circulation is necessary for proper operation of the sensor, so the sides of the box were replaced with perforated do-it-yourself sheet aluminum. The meter mounts in one face of the box as illustrated. The dry cell and its holder are in the bottom of the box to make the unit more stable. The sensor and resistors are mounted on a $\frac{1}{8} \times 1\frac{3}{4} \times 2\frac{1}{2}$ -in. sheet of Bakelite or other insulating material. Wire the unit according to the wiring diagram. The insulating board is fitted on short stand-off bushings to space it from the metal case. No on-off switch is included in the circuit as current drain is so low the dry cell will last about a year of continuous operation.

Locate the sensor element film-side down under the top of the case. This minimizes contamination from dust and dirt. Do not touch the coated surface with your fingers and do not blow cigarette smoke on it. Oils and tars will clog the porous coating and severely change sensor operation.

Calibration is a "cut and try" setting of the variable resistors. Once these screw-driver adjusted resistors are set they need no further attention. The variable arm is connected to the metal case while single lugs are one end of the wire resistors. R1 should be set so all the resistance is in the circuit; the arm should be fully rotated away from the fixed lug. R2 can have its arm near midpoint.

Zero humidity conditions are a near-impossible situation, but a closed hot shower run for five minutes will produce a close approximation of 100 per cent humidity. Local weather reports also give the relative humidity. Simply juggle the settings of R1 and R2 until the meter agrees with local conditions. Replace the perforated side plates and the meter is ready for use.

While it will take a little patience to properly calibrate the humidity indicator, once set it will remain in calibration. Try to keep R1 high, as this resistance protects the meter from excessive current.

Humidity Indicator

Parts List

B—"D" size dry cell.

HA-26 — Hygropak® humidity sensor, type HA-26.

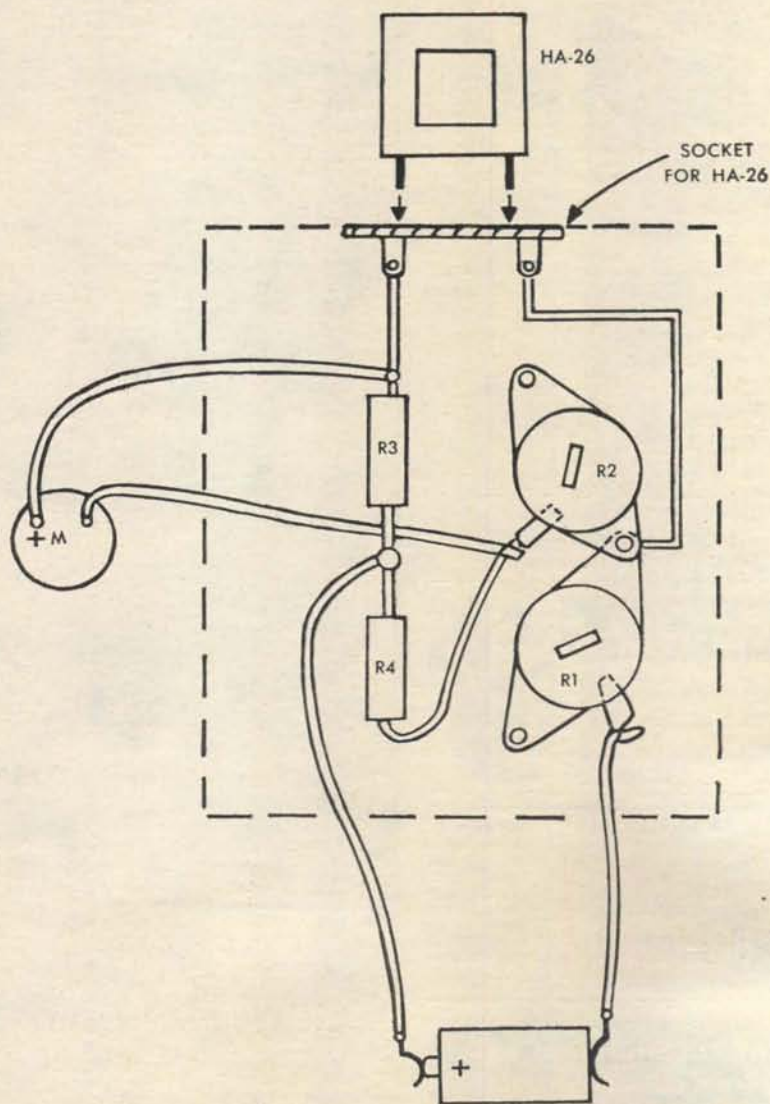
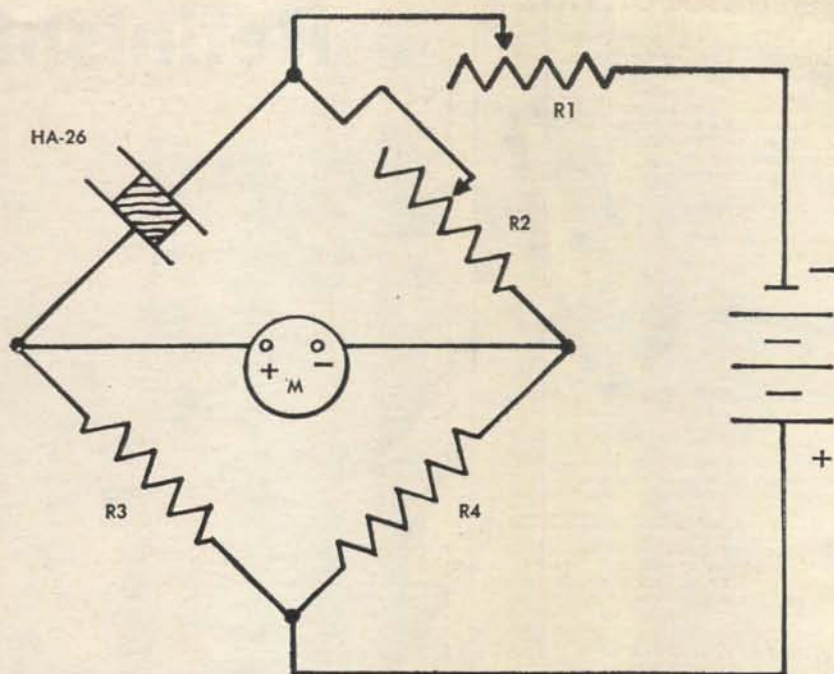
R1, R2—100-ohm variable resistors, (Mallory FL-100).

R3, R4—50-ohm, $\frac{1}{2}$ -watt resistors.

M—0 to 1 milliammeter, $1\frac{1}{2}$ in. dia.

Case—2 x 4 x 4-in. aluminum box, Bud AU-1083.

Misc.— Battery holder, sensor socket, Bakelite board, wire, solder, etc. $\Delta \Delta$



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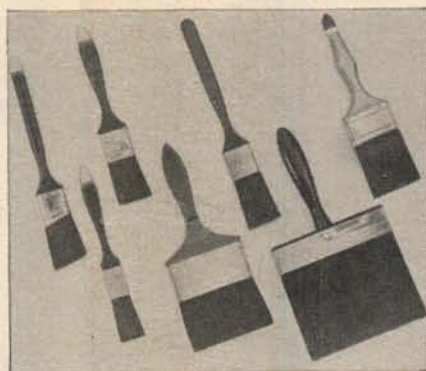
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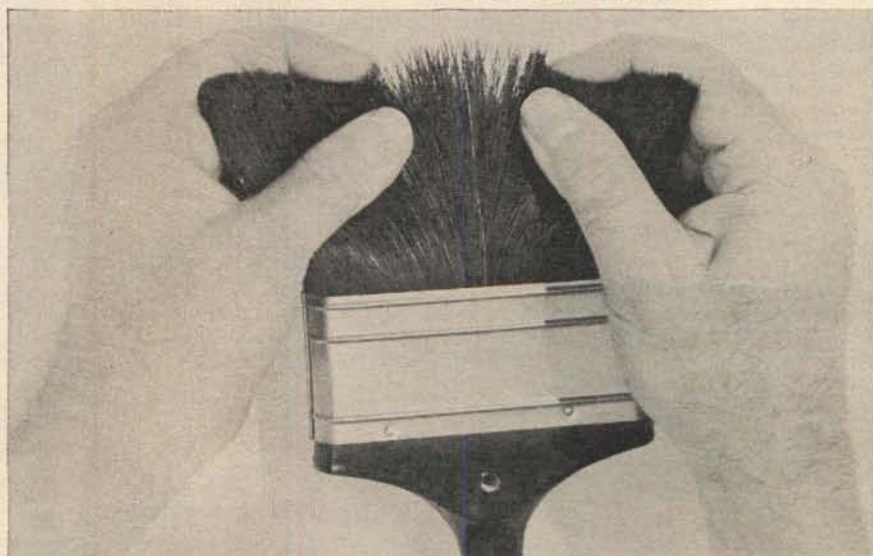
CHOOSING A PAINTBRUSH

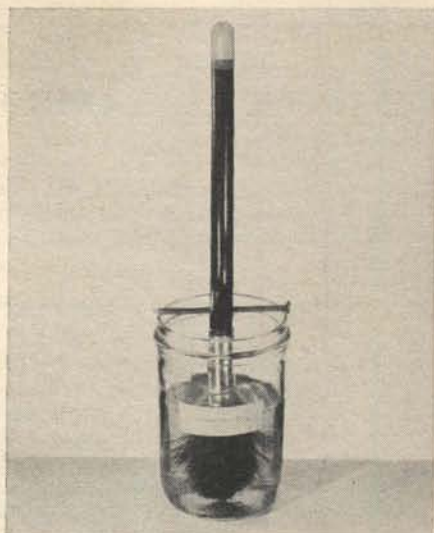


As with any tool, when you buy a paintbrush you get just about what you pay for. A paint job is only as good as the brush, and it just makes good sense to buy the best.

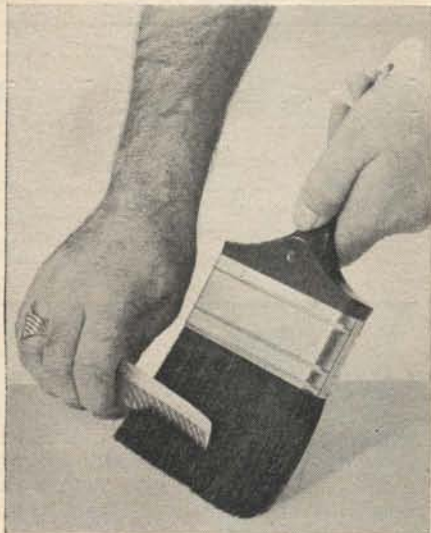
Price alone, of course, does not make a quality brush. There are several simple tests that any home owner can make right in the store to help him determine the quality

Inspection of quality brush will reveal tiny split ends on bristles, whether of animal hair or synthetics.





Bristle brushes of animal hair should be preconditioned in linseed oil for 12 to 24 hrs. before using, as here.

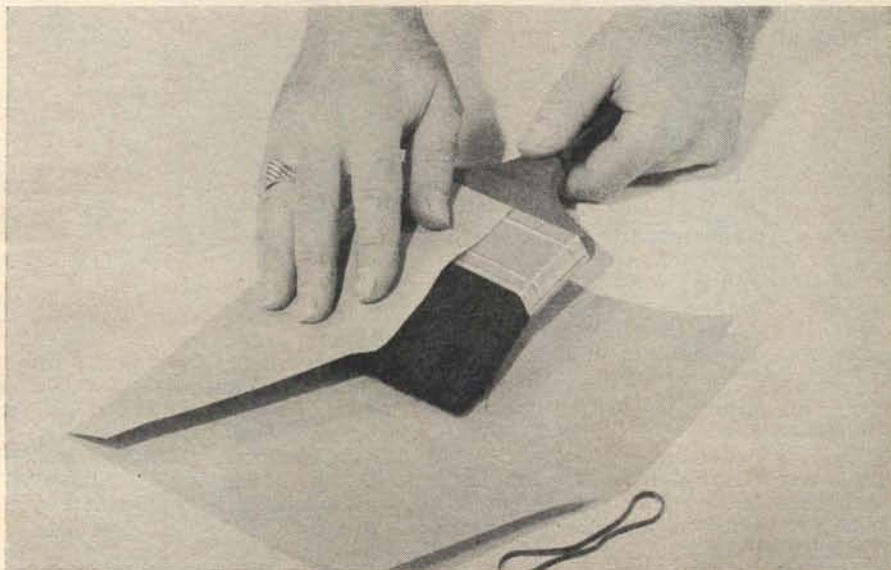


Quality paintbrushes should be combed with metal comb after cleaning to align bristles prior to storing.

of a paintbrush. First, keep in mind that each type of brush is made for a specific job. As a general rule, choose the widest brush practical for the job. This speeds the work and makes painting easier. For large, flat surfaces pick a 3 to 6-in. brush. Special wall, flatting, stucco or calcimine brushes are made in this range size for special surfaces. A 1 to 3-in. brush is best for woodwork, paneling and trim. Use enamel or varnish brushes when these materials are used. An oval or flat, 1 to 3-in. sash brush, either angled or straight is used for sash, dados and trellises. For furniture, toys, etc., pick a 1 to 3-in. enameling or varnish brush. Use the narrowest

sizes for chair legs and rungs, broader widths for painting table tops.

A good brush may have natural or synthetic bristles. Bounce the bristles against your hand to check their spring; it should be resilient, not too soft, not hard. Each bristle should have splits or flags on the ends. Better brushes have longer bristles, but they should not all be the same length, to assure exposing flags as the bristles wear down. Almost all good brushes have a filler strip of wood, metal or plastic in the base of the brush inside the ferrule to help shape the bristles into a natural taper. It also helps provide a natural paint reservoir for better paint flow. $\Delta \Delta$



After a brush has been cleaned, combed, allowed to dry thoroughly, it should be wrapped with heavy kraft paper or foil to keep its shape.

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Research Department

Last year we refinished our upright piano, first removing all the paint and varnish. We then stained it walnut and used satin-finish varnish. We now would like to replace some of the ivories on the keys; some are missing and some are yellow.

D. J. K., Vicksburg, Mich.



Your local piano tuner can replace the keys at a nominal cost, the price depending, of course, on whether the keys are genuine ivory or a plastic. If genuine ivory, the cost will be considerably higher than for plastic. If you feel equal to doing the job yourself, contact Lyon and Healy, 243 S. Wabash, Chicago 4, for piano parts. Be sure to give them all necessary data, such as type and make of piano, approximate age and so on. Giving this information is important if you are to get help from a supplier.

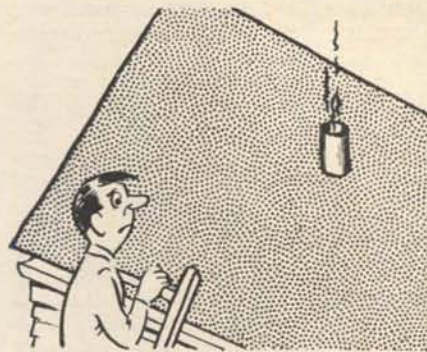
There is ceramic tile on the floor of the bathroom in our new home, and the grout is constantly coming loose in the joints. The walls were tiled at the same time and there has been no problem with them at all.

L. S. S., Penna.

We would guess from your description that the failure of the grouting in the floor-tile joints is due to spring in the floor, rather than from water and normal wear. If this guess is correct—and it is a common fault in newly-tiled floors in many new homes—then

the remedy is not simple nor easy. In several instances we know of it was necessary to install additional joists in order to take the springiness out of the subfloor. After this was done there was no further trouble with grouting. The subfloor under a ceramic-tiled floor must be rigid, no give whatever, as otherwise you have the trouble you describe. There simply is no practical way to remedy the problem by means of new grouting or the application of top coatings of any kind.

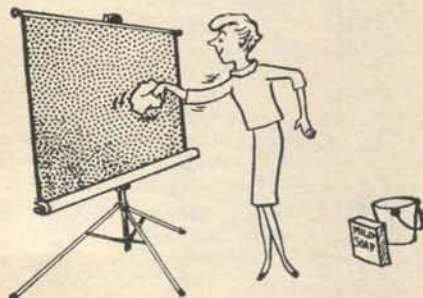
Our back yard is almost unusable because of the odor that comes from a sewer vent on the roof. The home is just 2 years old, and on a new street with a new sewer line 1400 ft. long. At present there are 8 homes occupied. One plumber said that the problem would lessen as more homes were built. Is this possible, or is the plumbing faulty? E. S. C., South Dakota.



Your plumber is correct in saying that the odor problem will lessen as more homes are built. He is basing this assumption on increased flow in the sanitary lines. We do not think the plumbing is faulty, as gas is escaping through the roof vent as it should. Unfortunately there is nothing much you can do at present. You might temporarily add an extension of 2 or 3 ft. to the vent so it is well above the roof ridge. This no doubt would help some. We believe it worth a try.

We have a beaded projector screen on which there are soiled spots that show up dark in a picture. One spot was caused by a moth getting rolled up in the screen. Someone borrowed the screen and tried to brush off the moth, making a dark spot about 6 in. in diameter. How can we clean it?

J. O. B., Wakefield, Kans.



Cleaning a beaded projector screen can be a rather ticklish job. A careful sponging with a mild soap-and-water solution should remove the moth stain. Perhaps the other dark spots will yield to the same treatment. If they do not, we suggest you take the screen to someone with facilities for the job. Perhaps a local dealer in photo supplies could help you.

How can you clean an acoustic-tile ceiling? Ours has become dingy and streaked because of air currents from our hot-air heat. Also, what effect would paint have on the soundproofing qualities of the tile? L. M. Z., Quincy, Ill.

Acoustic ceilings present no special maintenance problems, according to the Armstrong Cork Co. The tiles are fully washable and an occasional sponging with mild soapy water will remove any stains that accumulate. An acoustical-tile ceiling can be repainted as color preferences change, without appreciably affecting acoustical efficiency.

We have trouble with sweating pipes in the basement. Is there a simpler way of eliminating this problem than the tedious job of wrapping the pipes with strips of insulation?

J. J. C., Chicago.

We have recently tried a product called "No Sweat"; it is a plastic foam that is applied from an aerosol can. One 16-oz. can will cover about 50-ft. of 1-in. pipe, which makes it inexpensive as well as convenient to apply. If your hardware store does not have it, have the dealer contact King Manufacturing Co., Flint 6, Mich.

I have a "Carvit" machine that I have had for about 25 years. Is it possible to buy cutters or tools for it? The machine still runs all right, I just need cutters.

A. B., Westwood, New Jersey.

The machine known as "Carvit" was discontinued some years ago. It is just possible you can obtain suitable cutters from Woodworker's Tool Works, 222 S. Jefferson St., Chicago 6. We suggest you inquire of them direct.

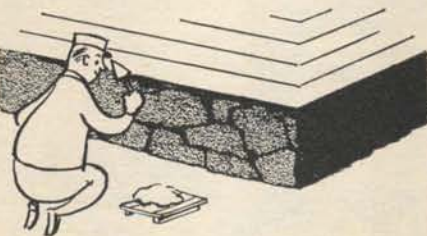
I know that linoleum cannot be installed on basement floors, or on concrete-slab floors, but is there a sheet-type flooring than can be used?

R. L. H., Minneapolis, Minn.

Yes, according to the Armstrong Cork Co. sheet vinyl flooring materials can be installed in basements and on-ground concrete slabs. The newest materials are manufactured in sheets 6 ft. wide and have a special moisture-resistant backing. Waterproof adhesives, of course, must be used.

My home, about 100 years old, has a fieldstone foundation. The spaces between the stones are filled with what appears to be a mixture of sand and clay. Former owners of the house have whitewashed the walls several times, but it is peeling and dropping off. The "mortar" between the stones also is falling out. Could something be sprayed on the walls to hold the remaining clay-sand mortar?

J. E. P., Allendale, New Jersey.



If we judge the condition of the clay mortar correctly from your description, then there is only one repair that can be considered at all permanent—knock out all the loose "mortar" and repoint the joints with new ready-mix cement mortar. There is no spray-on material that can be relied on to hold the clay mortar in place. Unless you have had some experience pointing masonry joints, this is a job for a local stone mason.

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Book and Booklet Reviews

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No.	Dark, round-head screws supplied)		
A	9/16"	9/16"	.20
B	1 1/16"	5/8"	.25
C	1"	3/4"	.35
D	1 1/8"	1"	.35
E	1 1/2"	1 1/4"	.40

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COLONIAL WORKSHOP

SHOP TIPS

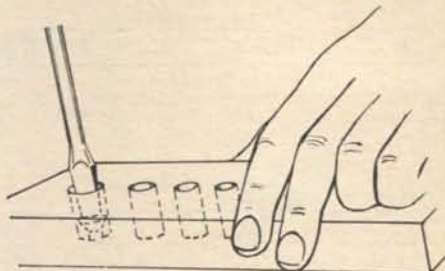
Food-Grinder Platform



In many modern kitchens there is no place to clamp a food grinder; the edges of the counter tops are too thick or do not project enough. To provide a place for clamping, fit four suction cups of the type used for auto-top carriers to a 12-in. square of 3/4-in. plywood. The cups will "clamp" firmly to the surface of a counter top and the food grinder is clamped to it. Apply several coats of varnish or shellac to the plywood to waterproof it, and drill a hole in one end to permit hanging.

Robert D. Lee, Riverside, Calif.

Stop Screw Driver Damage



This guide block with several holes to accommodate screw driver blades of various sizes is a real help in preventing damage to finished surfaces caused by a slipping driver blade. Hold the block with one hand to confine the screw in a hole just slightly larger than the width of the driver blade. If a screw driver tends to slip, check the tip; if worn or damaged, dress it to proper shape and a straight edge.

"Cast" Screw Anchors

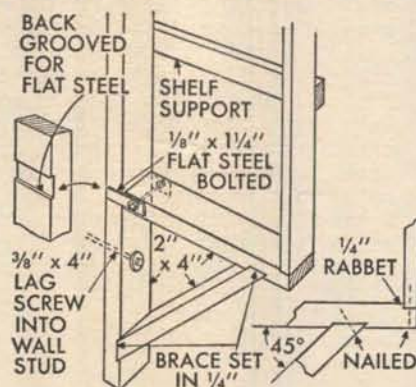


A neat way of anchoring screws in brick, concrete, cinder block, plaster and other materials is to first drill a hole slightly larger than the diameter of the screw. Next, wrap the threads of the screw with "Teflon" tape. Now, fill the hole with epoxy glue. Finally, insert the screw before the glue hardens. When the glue has set, the screw can easily be removed, as the "Teflon" prevents the glue from adhering to the screw.

Inexpensive Glue Pot

Many woodworkers still use hot glue, as it is unexcelled for some types of joints. The drawback is the cost of the glue pot, the electrically-heated models costing 18 or 20 dollars. I find that a baby-bottle warmer—you can pick them up for about a dollar in second-hand stores—will do the job fine. Put the glue in a small food tin, set it in the water in the warmer and it will stay at the same temperature as long as the warmer is plugged in.
L. J. Davis, Colorado Springs, Colo.

Heavy-Duty Shelf Brackets



An entire tier of shelves that is subjected to considerable weight can be supported completely on a wall by brackets when it is not desired to have legs extending to the floor. The horizontal member of the bracket is bolted to a U-shape piece of 1/8 x 1 1/4-in. flat steel that fits around the rear upright. A diagonal brace is set into both upright and horizontal pieces and is nailed. The rear upright is fastened to wall studs with lag-screws. The front upright rests in a rabet in the horizontal piece and is nailed to it. The brackets are spaced not over 4 ft. apart. Cross rails to support shelves are nailed or bolted to the front and rear uprights.

Soldering-Iron Rest



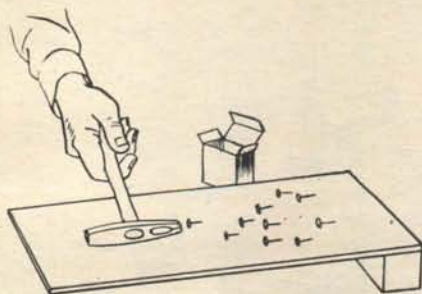
Improvised in a moment, this simple soldering-iron rest consists of two nails driven crosswise into a piece of scrap wood. It avoids burned spots on a bench top and holds the iron so it can be picked up conveniently.

Clean Tile Installation



Installing light-colored ceiling tile does require clean hands. Often even perspiration will cause stains on the tiles. To avoid this, dust your hands with ordinary corn starch before handling the tile. The powder shields the tile from perspiration and other causes of unsightly smudges.

Handy "Tack Board"



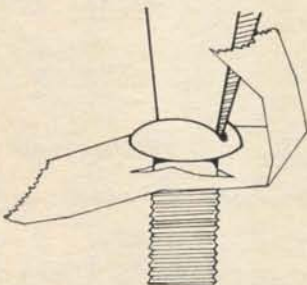
A slanting surface, made by nailing a 2 x 2-in. strip of wood to a 12 x 14-in. piece of Masonite is an aid when driving tacks with a magnetic hammer. Spill the tacks onto the surface, then jar it lightly to make all the tacks face with the heads down. It then is a simple matter to pick them up one by one with the hammer and drive them home.

Woodcutting Hacksaw



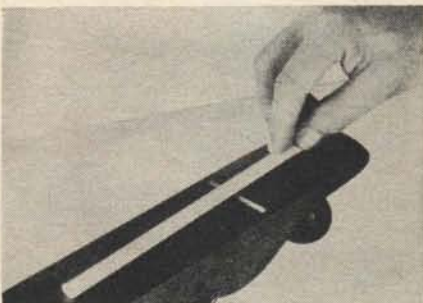
Bandsaw blades that break and become so "mangled" that they no longer are usable in the machine often can be utilized in a hacksaw frame. Cut the blade into suitable lengths and drill holes for the saw frame. Narrower blades can be utilized in this manner in a coping-saw frame.

Tape Holds Screw



Where you cannot hold a screw in position to start it, use a strip of 1/2-in. masking or similar tape on the end of the screw driver. Punch a hole or make a tiny cross cut at the center of the tape, then push the screw through from the adhesive side. Press the tape onto the screw driver shank so the screw extends straight out from the tip. When the screw is started the tape simply is pulled off the screw.

Flats On Dowels



When a dowel is used for edge-to-edge joints a "flat" is needed to allow the escape of excess glue and air. This is best done, as indicated, before the dowel is cut into short lengths. Grip a hand plane in a vise and take about a 1/32-in. cut. Use a dowel long enough so your fingers do not pass over the blade.

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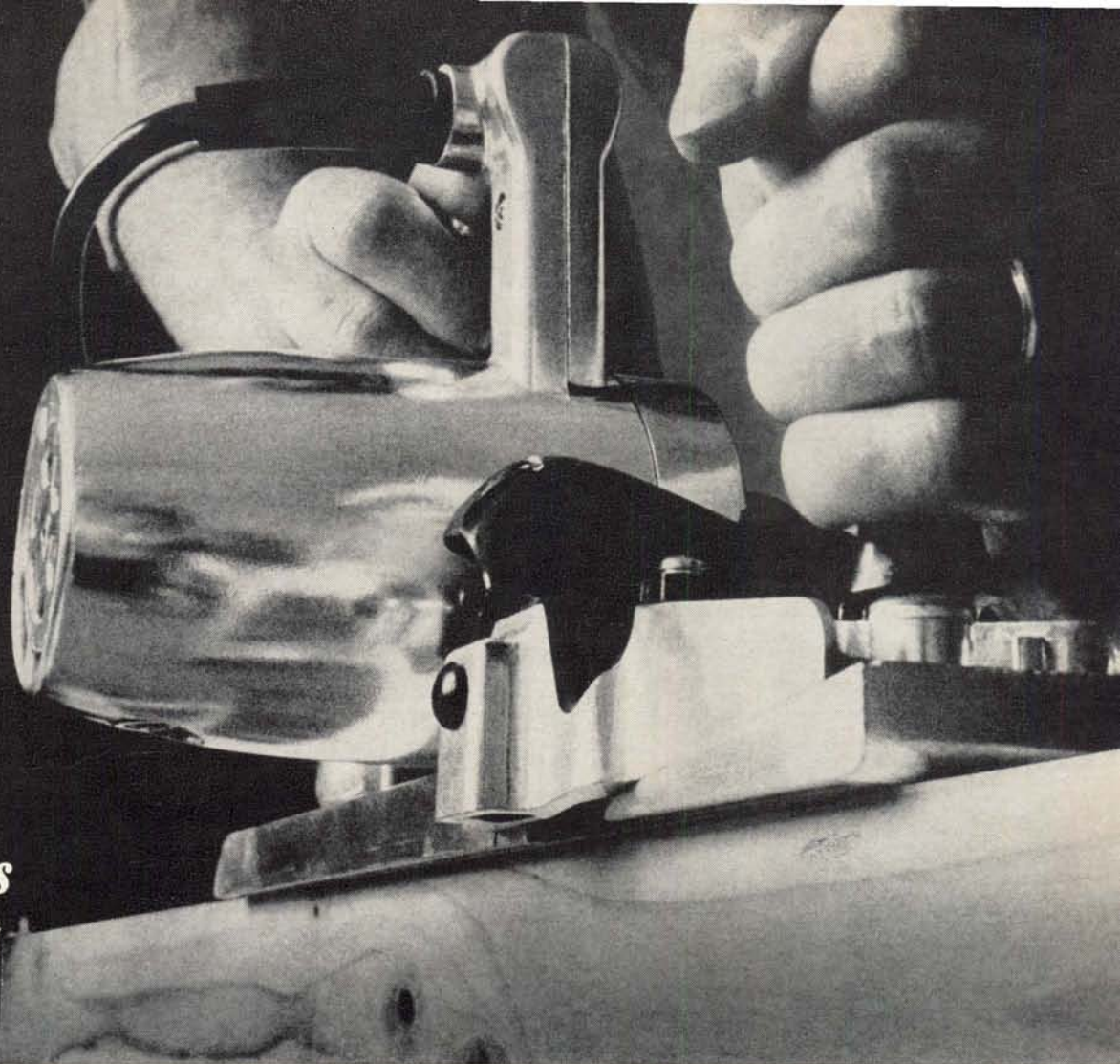
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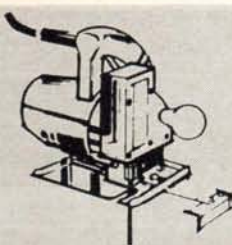
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At the start, you may want to render service yourself . . . or you can start out with servicemen. This business is easy to learn . . . easy to start . . . so easy to service that women dealers often do it. We prefer you have no experience . . . not have to "unlearn" old methods.

We are NOW enlarging this worldwide system of individually-owned service businesses. If you are reliable, honest and willing to work to become financially independent, we invite you to mail the coupon.

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When you receive our illustrated booklet, you will see the way we show you step by step how to quickly get customers . . . how to steadily build more customers from their recommendations.

All six services are rendered "on location" in homes, offices, hotels, theaters, churches, clubs, motels and institutions.

These superior, safer and convenient methods spread Duraclean dealerships throughout North and South America, Africa, Portugal, England, Israel, Norway and many other countries.

National Magazine advertising explains the

superior merits of your services, builds your customer confidence and brings job leads to you.

We and a Duraclean dealer will train you and assist you. He'll reveal his successful, proven methods. We show you all you need to know.

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Furnishings stores, insurance adjusters, and decorators refer jobs to our dealers. These year 'round services are in constant demand.

TODAY is the time to reserve a Duraclean dealership . . . before someone takes your location.

Start Small, Grow Big . . . in this Booming Business

Many men have said to us, "I can't afford to give up my job till I know I have a sure thing . . . a sound business that will provide both security and a better living for my family."

That made sense to us so we worked out such a plan . . . and those same men are now enjoying Duraclean dealerships in many communities. You don't experiment. You use tested, proven methods. You have our backing and "know how."

Does this appeal to you? Don't decide now. Mail the coupon so you'll have the facts to decide wisely. There is no obligation whatsoever. You will then know whether this is what you want.

You can start small and grow big just as we did. A third of a century ago Duraclean was an idea . . . but it caught fire and spread rapidly to a worldwide service. It spread because it was based upon (1) superior processes and (2) proven customer-getting methods.

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Government figures show service businesses growing faster than industries and stores . . . \$750 million yearly potential just in rug and furniture cleaning. You have 5 other services.

Space here will not permit describing your other services but they are fully explained in the free booklet we'll mail you. You have six opportunities for profit on every job.

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Men frequently take in partners.

We furnish electric equipment and enough materials to return your TOTAL investment. If you have good habits and know the importance of customer satisfaction, you can likely qualify for a Duraclean dealership.

It's been said, "Opportunity knocks but once at every man's door." This could be that one rare opportunity in your life.

It is surprisingly easy to learn this business. You can decide from the information we will send you whether to apply for a dealership. So, with no obligation whatever, mail the coupon TODAY.

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What Dealers Say:

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R. C. Blue: Customer called a prominent competitor. They said they could not clean her badly soiled furniture . . . to contact me. "If anyone could get it clean, I could!"

Charles Randal: Business keeps growing. Made as much as \$120 in one day.

D. Kern: Duraclean's proved-best process and the continuous help from headquarters gave me a big jump on all competition.

George Byers: For University, my total billing was \$2,416. Total expenses \$814.

Gerald Wehrauch: Three persons called me saw Duraclean advertised in magazines.

Edward Hoy: A smoke damage insurance claim bill was \$186. All work was done by me in exactly 8 hours and 2 minutes.

John Hoak: I've never worked at anything I enjoyed more than Duraclean.

W. C. Smith: Earned \$650 one week. Volume keeps getting bigger.

Service man for dealer C. Wood: Furniture was filthy black. When through, I was amazed how clean.

Loren Farris: I'm proud to be independent at 30. I wish I had known about Duraclean earlier.

Earl Davis: Our sales increased \$17,660 this year.

Ed. Kramsky: In 2 years, I now have two assistants, a nice home and real security for my family.

Resale Service

If, because of illness, moving or for any reason a dealer wants to sell, we maintain a service to locate buyers and to help him sell.

Dealerships resell at up to 10 times the dealer's cost. R.D.K., after 5 months, sold for \$2,000 above his cost. L.L., after 30 months, got \$7,116 more than he had paid. The value of your dealership and franchise grows monthly.

FREE BOOKLET tells how to Start Your Own Business

With no obligation, we'll mail you a letter and 24 page booklet explaining this business . . . how and why your income grows . . . how we help finance you.

Then decide if this opportunity fulfills your dream of independence and a much bigger income.

Your location should be taken tomorrow . . . so mail coupon today.

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in a dynamic business of your own

What it can mean to you



Mail this coupon TODAY It may put you in business

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